

Who' s Who In IVHS 1994

A Reference Guide To
Federal, State, and
Local Contacts



IVHS A M E R I C A

150059

Editor: Mary Anne Thompson

Note: The Editor has made every attempt to include all Federal, State, and Local Transit Agency IVHS programs in this Guide. If, for some reason, your program does not appear, please notify IVHS AMERICA so that your information may be included in the next edition.

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PART ONE

Congressional Overview

LEGISLATIVE FACT SHEET-103rd CONGRESS

Introduction

Intelligent Vehicle Highway Systems (IVHS) has gained significant support in the U.S. Congress over the past few years. In 1991, Congress passed the Intermodal Surface Transportation and Efficiency Act (ISTEA) which included the Intelligent Vehicle Highway Systems (IVHS) Act, establishing specific goals and objectives for a nationwide effort.

“The Act sets forth a clear statement of congressional support and interest in IVHS. It provides the legislative foundation for a national and comprehensive program to advance and use IVHS to help reduce traffic congestion, increase economic productivity, and enhance highway safety,” reported the Congressional Research Service (CRS).

In FY89, the Federal Highway Administration (FHWA) spent \$2 million on IVHS. In FY90, that amount doubled. In the FY91 budget request, the Administration requested \$13 million and Congress appropriated \$20 million, reported CRS. In FY95, President Clinton’s budget request was \$289 million for IVHS, a \$75 million increase over FY94 levels.

“The result is a budget for 1995 that sets unprecedented levels for transportation investment in this country. This budget is about investment — in jobs, infrastructure, safety, technology and most importantly in America’s competitive future,” testified Transportation Secretary Federico Pena before the House Appropriations Subcommittee on Transportation in February.

In the U.S. Congress, IVHS issues are discussed by the House Appropriations Subcommittee on Transportation, chaired by Rep. Bob Carr (D-MI-8) and the Senate Appropriations Subcommittee on Transportation and Related Agencies chaired by Sen. Frank Lautenberg (D-NJ). As Secretary Pefia testified before the House Appropriations Subcommittee on Transportation: “IVHS will help us meet our objectives of improving the efficiency of the nation’s infrastructure, enhancing the environment, and supporting defense conversion efforts. “

Other committees interested in IVHS include the House Budget Committee, chaired by Rep. Martin Olav Sabo (D-MN-5), the House Public Works and Transportation Committee, chaired by Rep. Norman Mineta (D-CA-15) and the House Science, Space and Technology Committee, chaired by Rep. George Brown (D-CA-42).

IVHS will also be an important tool in improving transportation safety. FHWA Associate Administrator for Safety and Systems Applications, Dennis C. Judycki, testified before the House Public Works Subcommittee on Investigations and Oversight that safety objectives for IVHS include reducing significantly the number of fatalities and injuries due to accidents and improving the safety of private vehicles, transit fleets, commercial vehicles and hazardous materials movements.

Chairman Bob Carr (D-MI-8) of the House Appropriations Subcommittee on Transportation convened a hearing at the IVHS AMERICA Annual Meet-

ing in 1993. "Given the condition of our Nation's transportation system and the budget crunch that we face today, we really don't have a good alternative to the IVHS approach. We will not be able to build our way out of the congestion and air pollution problems that we have. We have to exploit the technologies available today and develop techniques that we will need in the future," Chairman Carr stated at the hearing.

The following lists the key Congressional committee and staff assignments for the 103rd Congress. To connect to all Congressional offices, telephone (202) 224-3121.

SENATE COMMITTEE ON APPROPRIATIONS

Subcommittee on Transportation and Related Agencies

This subcommittee sets funding levels annually for DOT and thus is one of the most important committees for the IVHS community.

Democrats

Frank R. Lautenberg, NJ — Chair
 Robert C. Byrd, WV
 Tom Harkin, IA
 Jim Sasser, TN
 Barbara A. Mikulski, MD

Republicans

Alfonse M. D'Amato, NY — Ranking
 Pete V. Domenici, NM
 Mark O. Hatfield, OR
 Arlan Specter, PA

Majority Staff

Patrick J. McCann — *Chief Clerk*
 Peter Rogoff
 Joyce C. Rose

Minority Staff

Anne Miano
 Dorothy Pastis

Senator Lautenberg, up for reelection in 1994, is a great friend of the IVHS community. He is the most vocal proponent of IVHS on Capitol Hill, and authored the IVHS Act of 1991, which was contained in the ISTEA bill. Lautenberg's legislative aide for transportation is Russell Houston.

Senator Mikulski is also interested in IVHS. Her transportation staffer is George Leventhal.

HOUSE COMMITTEE ON APPROPRIATIONS

Subcommittee on Transportation and Related Agencies

Performs same function as Senate subcommittee. The funding differences are ironed out in joint conference every fall. Also a key committee.

Democrats

Bob Carr, MN — *Chair*
Richard J. Durbin, IL
Martin Olav Sabo, MN
David E. Price, NC
Ronald D. Coleman, TX
Tom Foglietta, PA

Republicans

Frank R. Wolf, VA — Ranking
Tom Delay, TX
Ralph Regula, OH

Majority Staff

Del Davis — Chief of Staff

Minority Staff

John Blazey

Bob Carr, Chairman of the Subcommittee, is very pro-IVHS. His transportation aide is Mark Miller. Carr focused on cost/benefit analyses of transportation projects in the appropriations process for FY 94 and may do so again. Frank Wolf, from heavily congested northern Virginia, is also supportive of IVHS.

While at this time the appropriations subcommittees are the most important for IVHS, there are other committees whose jurisdictions could have an impact on the future development and deployment of IVHS. Any future legislation would probably have to move through at least one of these committees.

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

Subcommittee on Water Resources, Transportation, Public Buildings and Economic Development

This subcommittee's jurisdiction includes all highway issues.

Democrats

Daniel P. Moynihan, NY — Chair
George J. Mitchell, ME
Harry Reid, NV
Howard M. Metzenbaum, OH
Barbara Boxer, CA

Republicans

John W. Warner, VA — Ranking
Dave Durenberger, MN
Robert C. Smith, NH
Dirk Kempthorne, ID

Majority Staff

Kathryn Ruffalo

Minority Staff

lean Lauver

SENATE COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION

Subcommittee on Communications

This subcommittee deals with all FCC issues, including the allocation and regulation of radio spectrums.

Democrats

Daniel K. Inouye, HI — *Chair*
 Ernest F. Hollings, SC
 Wendell H. Ford, KY
 J. James Exon, NE
 John F. Kerry, MA
 John B. Breaux, LA
 John D. Rockefeller IV, WV
 Charles S. Robb, VA

Majority Staff

Antoinette D. Bush
 John D. Windhausen, Jr.

Republicans

Bob Packwood, OR — Ranking
 Larry Pressler, SD
 Ted Stevens, AK
 John McCain, AZ
 Conrad Burns, MT
 Slade Gorton, WA

Minority Staffs

Gina Keeney
 Mary McManus

SENATE COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION

Subcommittee on Surface Transportation

This subcommittee's jurisdiction includes highway safety issues.

Democrats

J. James Exon, NE — *Chair*
 John D. Rockefeller IV, WV
 Daniel K. Inouye, HI
 John B. Breaux, LA
 Charles S. Robb, VA
 Byron Dorgan, ND
 Harlan Mathews, TN

Majority Staff

Donald M. Itzkoff
 William Clyburn, Jr.

Republicans

John McCain, AZ
 Bob Packwood, OR
 Conrad Burns, MT
 Trent Lott, MS
 Judd Gregg, NH
 Kay Bailey Hutchison, TX

Minority Staff

Gerri Hall
 Alan Maness

ROUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

Subcommittee on Surface Transportation

This subcommittee deals with highway and safety issues.

Democrats

Nick Joe Rahall II, WV — *Chair*
Tim Valentine, NC
Bob Clement, TN
Jerry F. Costello, IL
Greg Laughlin, TX
Glenn Poshard, IL
Dick Swett, NH
Bud Cramer, AL
Peter A. DeFazio, OR
Jerrold Nadler, NY
Leslie Byrne, VA
Marcia Cantwell, WA
Pat (Patsy Ann) Danner, MO
Robert Menendez, NJ
James E. Clyburn, SC
Dan Hamburg, CA
Walter R. Tucker III, CA
Eddie Bernice Johnson, TX
Douglas Applegate, OH
Ron de Lugo, VI
William O. Lipinski, IL
James A. Traficant, Jr., OH

Majority Staff

Kenneth House — *Chief*
John F. Fryer — *Counsel*
Alathea E. Riley
Car-yll F. Rinehart
Roger Slagle
Kathleen Hoffman
James H. Zoia

Republicans

Thomas E. Petri, WI — *Ranking*
William F. Clinger, Jr., PA
Bill Emerson, MO
Bill Zelif, Jr., NH
Jennifer Dunn, WA
Tim Hutchinson, AR
Bill Baker, CA
Mix Collins, GA
Jay Kim, CA
David A. Levy, NY
Bob Franks, NJ
Peter Blute, MA
Howard P. (Buck) McKeon, CA

Minority Staff

Becky L. Weber — *Counsel*
Roger Nober — *Counsel*
Debra A. Gebhardt

Congressman Rahall (D-WV-3) took over the subcommittee from Congressman Norman Y. Mineta (D-CA-15), now Chairman of the full committee. Rahall is seen as favoring infrastructure development. Chairman Mineta is a well-respected legislator who often seeks a national perspective on transportation issues.

HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

Subcommittee on Investigations and Oversight

This subcommittee is charged with the investigation and review of any matters within the jurisdiction of the full committee, but has no legislative jurisdiction.

Democrats

Robert A. Borski, PA — Chair
Barbara-Rose Collins, MI
Robert E. Wise, Jr., WV
Greg Laughlin, TX
Lucien E. Blackwell, PA
Leslie L. Byrne, VA
James A. Barcia, MI
Bob Filner, CA
Eddie Bernice Johnson, TX

Majority Staff

John V. Wells
Randolph W. Deitz
Richard Tearle
Vincent F. Fabrizio
David Smallen

Republicans

James M. Inhofe, OK — Ranking
John J. Duncan, Jr., TN
Susan Molinari, NY
Bill Zeliff, NH
Wayne T. Gilchrest, MD
Bill Baker, CA

Minority Staffs

Charles C. Ziegler
Ruth Van Mark
Kathy Guilfoxy

HOUSE COMMITTEE ON ENERGY AND COMMERCE

Subcommittee on Telecommunications and Finance

This subcommittee deals with telecommunications and information transmission issues.

Democrats

Edward J. Markey, MA — *Chair*
W.J. (Billy) Tauzin, LA
Rick Boucher, VA
Thomas J. Manton, NY
Richard H. Lehman, CA
Lynn Shenk, CA
Marjorie Margolies-Mezvinsky, PA
Mike Synar, OH
Ron Wyden, OR
Ralph M. Hall, TX
Bill Richardson, NM
Jim Slattery, KS
John Bryant, TX
Jim Cooper, TN

Majority Staff

David H. Moulton
David Nemptow
Gerald J. Waldron
Timothy J. Forde
Elise Hoffman
Jeff Duncan
Cohn Crowell
Mark Horan
Kristan Van Hook

Republicans

Jack Fields, TX — Ranking
Thomas J. Bliley, VA
Michael G. Oxley, OH
Dan Schaefer, CO
Joe Barton, TX
Alex McMillan, NC
J. Dennis Hastert, IL
Paul E. Gillmor OH

Minority Staff

Stephen Blumenthal
Michael Regan
Catherine Reid
Peter D. Rich

PART TWO

Federal Organizations

US DOT IVHS Organization and Modal Responsibility

Within the Federal sector, the US Department of Transportation (DOT) provides the national framework of support for IVHS, and ensures the broadest Federal integration. US DOT has the responsibility for encouraging and coordinating the development of technology and the associated knowledge base, for developing standards of system performance for meeting safety goals, and for ensuring the nationwide compatibility of IVHS systems. In addition, US DOT spending on research, operational tests, and evaluations stimulates private sector and State and local government efforts. Finally, Federal-aid funding from the Highway and Mass Transit Trust Fund, administered by the Department, will be available for implementation of IVHS nationwide.

Within the Department, **the Federal Highway Administration (FHWA)** has been designated the lead agency for coordinating the Department's IVHS program. Management responsibility for individual program elements, however, also resides in the Office of the Secretary of Transportation (OST) and in the other modal administration described in the following paragraphs. FHWA is particularly concerned with improving the operational efficiency and safety of highway transportation and related vehicle parking, bicycle, and pedestrian systems. Its focus is on the development of traffic information and management systems, and on safety, productivity, and capacity issues related to highway operations including public transportation and motor carriers. IVHS applications can potentially assist the FHWA in fostering improvements in all of these focus areas. In addition, FHWA has management responsibility for several specific key components of the DOT IVHS program, notably the development of a National System Architecture, support of Corridor Applications both in major designated Interstate corridors and in other travel areas, and the prototype demonstration of an Automated Highway System by 1997.

The Federal Transit Administration (FTA) has established an Advanced Public Transportation Systems (APTS) program to assist in the development and evaluation of advanced technologies in public transportation. The overall goal of this program is to develop a body of readily accessible information on technology that enhances public transportation, and to demonstrate the technology in operating models. The program is structured to undertake research and operational tests of innovative applications of advanced navigation, information, and communication technologies that most benefit public transportation. Through the APTS program, FTA has the ability to support and coordinate the development and application of these technologies within the public transit and ride-sharing industries.

The role of **the National Highway Traffic Safety Administration (NHTSA)** is to facilitate the identification and development of safety-effective IVHS products and systems. This role has two aspects. The first aspect focuses on the po-

tential of IVHS to improve the crash avoidance characteristics of motor vehicles. NHTSA will seek to demonstrate that improved safety can be achieved by enhancing the crash avoidance performance of motor vehicles through the application of IVHS technologies. In this respect, the Agency will undertake research, establish safety targets, develop performance specifications, evaluate safety performance, participate in demonstration programs, and facilitate the commercial deployment of IVHS systems and equipment which improve crash avoidance capabilities. The second aspect relates to the safety characteristics of those applications whose primary benefit is not crash avoidance. NHTSA will be responsible for assuring that these applications enhance, rather than degrade, the overall safety of the highway system and the driving experience when they are incorporated into motor vehicles.

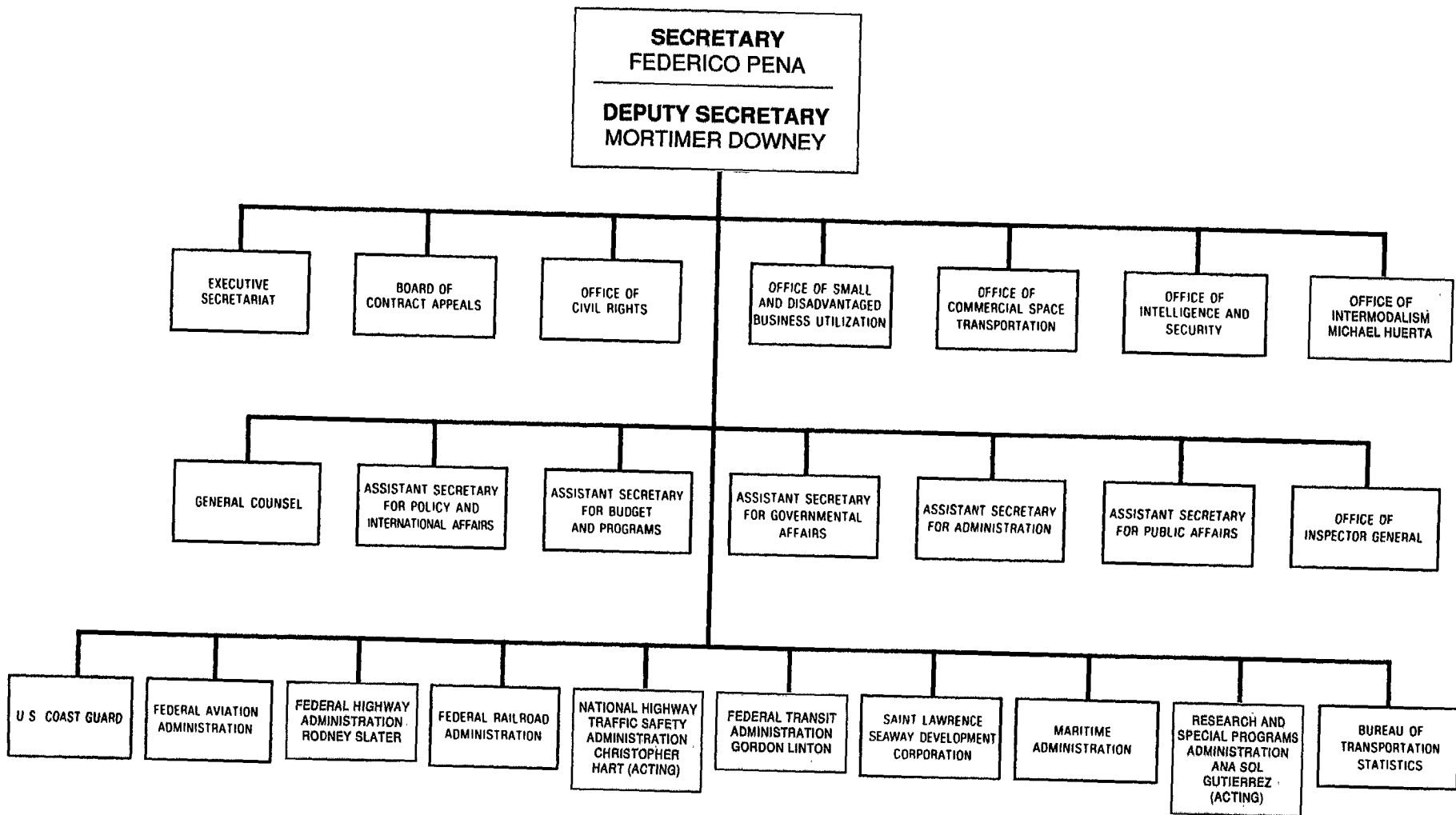
The Research and Special Programs Administration (RSPA) is interested in transportation system approaches and technologies with intermodal impacts, including the development and implementation of telecommunication and radionavigation policy. Through the R & D Coordinating Council, RSPA provides policy direction and coordination of the Department's R & D activities. RSPA is particularly concerned with the safety of hazardous materials transportation (HAZMAT), as well as the role of universities and small business in fostering innovation in the field of transportation.

RSPA also operates **the Volpe National Transportation Systems Center**, a national technical resource comprised of a core Federal technical staff supported by leading private transportation research firms and universities throughout the country. The Volpe Center provides transportation research, planning, analysis, and systems engineering services on a cost reimbursable basis. The Center provides support to FHWA, FTA, NHTSA, OST, and RSPA interests relative to a broad spectrum of IVHS matters.

The principal responsibility of the Office of the Secretary of Transportation (OST) is to provide policy development and program oversight as well as coordination among the various DOT agencies. It is responsible for ensuring that the various elements of the IVHS program are consistent with the Department's statutory responsibilities, including intermodal and international concerns and other DOT programs, and with National Transportation Policy. OST is also responsible for reviewing proposed budgets, evaluating significant legal issues related to IVHS, and initiating research on major IVHS policy and institutional issues that transcend the individual responsibilities of the operating administrations. Within OST is the Office of Intermodalism which serves to coordinate departmental efforts to develop an intermodal transportation system to move people and goods in an energy-efficient manner and obtain the optimum yield from the nation's transportation resources. The Office will work with IVHSAMERICA to explore ways to broaden IVHS to include other modes of transportation such as rail, air and sea, and determine how these might be integrated into an effective intermodal transportation system.

Source: US DOT IVHS Strategic Plan

U.S. DEPARTMENT OF TRANSPORTATION



Federal Highway Administration

Administrator: Rodney E. Slater

Deputy Administrator: Jane F. Garvey

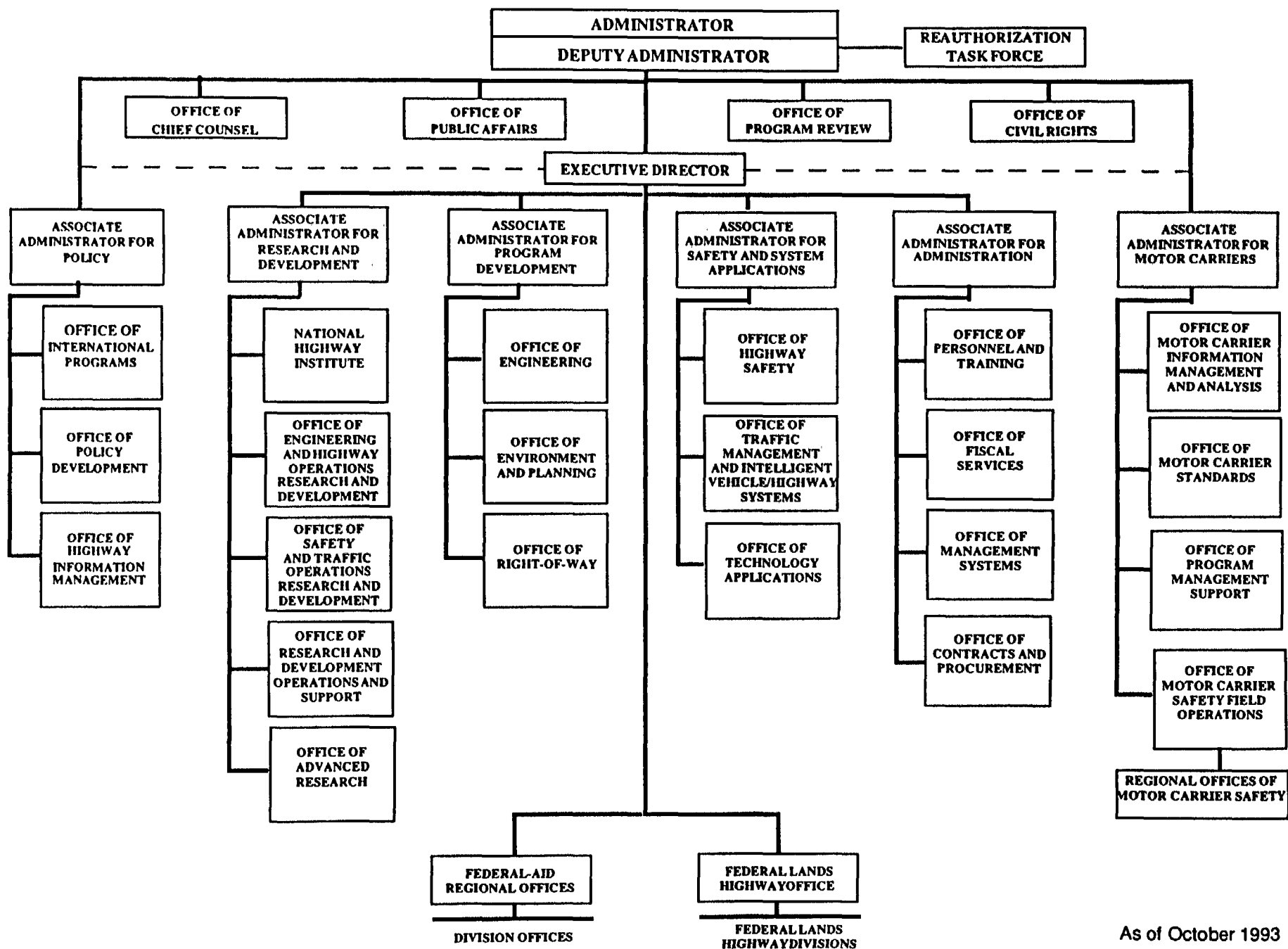
The Federal Highway Administration (FHWA) is responsible for administering the multi-billion dollar Federal-Aid Highway Program and for administering, jointly with the National Highway Traffic Safety Administration (NHTSA), State and community highway safety programs. Under the Federal-Aid Highway Program, FHWA provides financial assistance to State highway agencies for constructing the Interstate Highway System, other National Highway System projects, and those transportation related projects eligible for the Surface Transportation Program. Under the federal aid program and State and community highway safety programs, individual States act as the contracting agencies responsible for the expenditure of most of the available funds.

Under the Federal Lands Highway Program and the Emergency Relief Program on Federally-Owned Roads, FHWA is responsible for working with federal land-owning agencies to design, procure, and administer the construction or improvement of federal roads. Under these programs, FHWA procures design and construction services directly and is responsible for the expenditure of available funds.

The FHWA is the recognized authority on highway construction technology and design. Much of its work contributes to advancements in the state-of-the-art in various technologies. Under the Nationally Coordinated Program of Highway Research, Development, and Technology, FHWA coordinates an extensive research, development, and technology transfer program. The coordinated program includes such major categories as safety, Intelligent Vehicle Highway Systems (IVHS), pavements, structures, materials, policy, planning, environment and right-of-way, and motor carrier transportation. The research program endeavors to improve the quality and durability of highways and streets, reduce construction and maintenance costs, and reduce the negative impacts of highway transportation. The FHWA Technology Transfer Program, designed to encourage the application of new technology by highway agencies, uses contractors with marketing and training skills, as well as technical expertise, to present new technologies. Engineering disciplines involved in FHWA contracts include civil, mechanical, geotechnical, chemical, hydraulic, electrical, environmental, and human factors.

The FHWA is increasing its emphasis on improving traffic safety and reducing congestion through the application of advanced electronic and communications techniques. The FHWA is contracting for IVHS Operational Field Tests to increase safety and mobility, as well as planning studies to determine how developed IVHS technologies and products can be deployed into existing highway infrastructures. Most such tests require consortia of transportation agencies, academic institutions, and private sector organizations to develop joint proposals for such undertakings. When circumstances warrant outside

FEDERAL HIGHWAY ADMINISTRATION



assistance in research work other than through contract agreements, FHWA may solicit participation through grants, cooperative agreements, and collaborative research agreements.

The FHWA responsibility to provide highway and motor carrier safety involves the research and administration of a wide variety of activities, ranging from accident investigation to highway design, improvement and use. The FHWA programs are designed to meet the increasing demands for solutions to urgent safety problems and providing new, longer-range initiatives in safety hardware, driver aids, traffic operations, and systems performance measurement. In addition, FHWA provides technical assistance and advice on highway engineering and administration to foreign nations through the Agency for International Development, the Export-Import Bank, and other international lending institutions.

Contracting authority is delegated to the Office of Contracts and Procurement in the Washington Headquarters and to the Eastern, Central, and Western Federal Lands Highway Division Offices. The Office of Contracts and Procurement awards all FHWA R&D contracts and all contracts for services and equipment in support of FHWA highway planning, research, training, and related support services. The Office of Contracts and Procurement procures supplies materials, equipment, and professional services related to R&D, construction, and other program responsibilities. It also provides procurement services to the Office of Motor Carriers to support the safety and motor transportation mission.

The FHWA Federal Lands Highway Division Offices awards contracts for survey, design, and construction of forest highways, park roads and parkways, Indian Reservation roads, Defense Access roads and other roadways that provide access to or within federal lands. These contracts are awarded by the three division offices located in Sterling, Virginia; Denver, Colorado; and Vancouver, Washington.

Federal Highway Administration

Rodney E. Slater, Administrator	(202) 366-0650
Jane F. Garvey, Deputy Administrator	(202) 366-2240

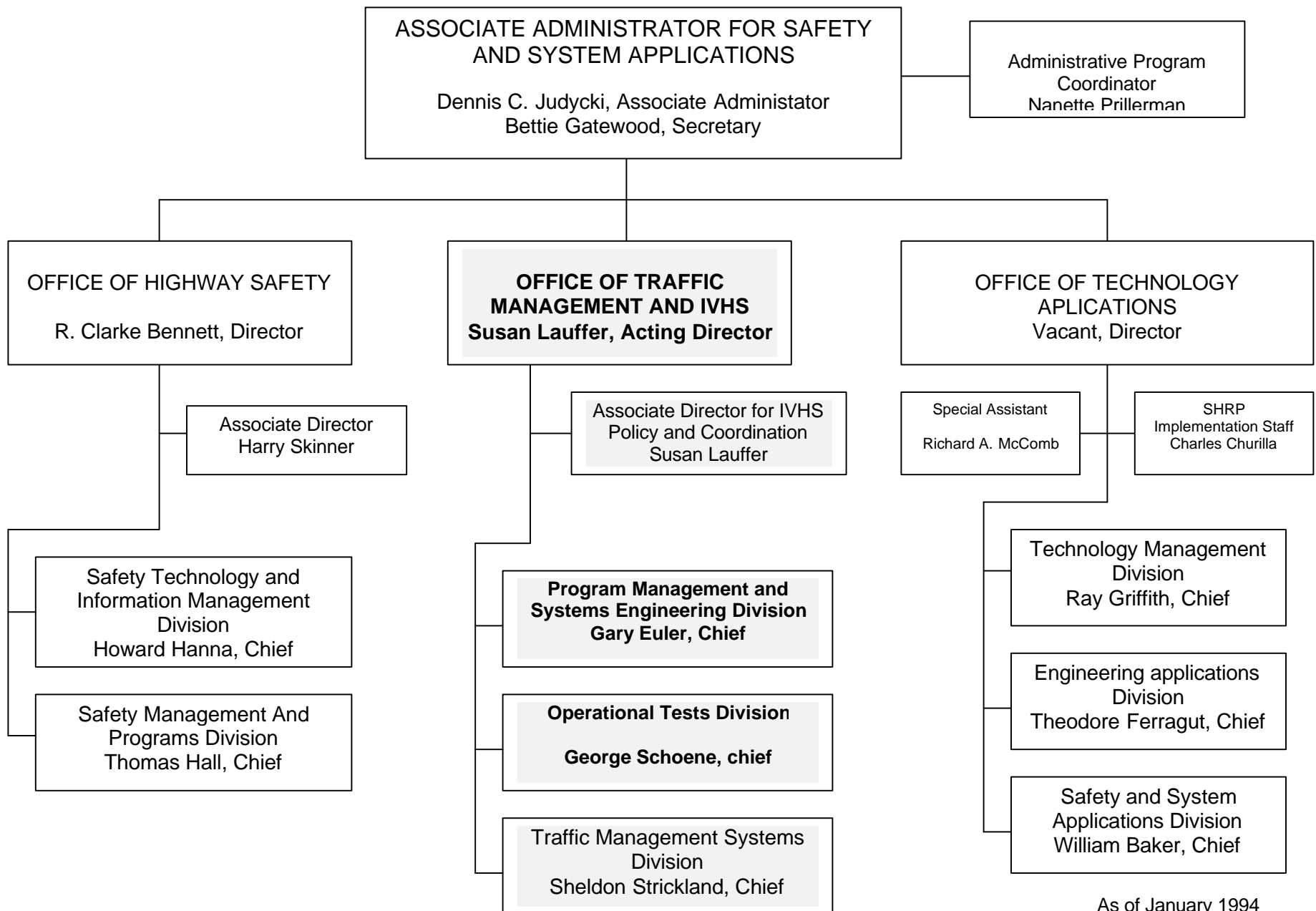
Associate Administrator for Safety and System Applications

Dennis C. Judy&i, Associate Administrator	(202) 366-2149
Bettie Gatewood, Secretary	(202) 366-2149
Nanette Prillerman, Administrative Program Coordinator	(202) 366-1808
Judith Morrin, Administrative Officer	(202) 366-2156
Gerri Bass, Clerk	(202) 366-4304

Office of Traffic Management and Intelligent Vehicle Highway Systems (WV-1)

Susan Lauffer, Acting Director	(202) 366-0372
Susan Lauffer, Associate Director	(202) 366-0372
Joan Gaines, Secretary	(202) 366-0372

FEDERAL HIGHWAY ADMINISTRATION SAFETY AND SYSTEM APPLICATION



As of January 1994

Office of Traffic Management and Intelligent Vehicle-Highway Systems (IVHS)

IVHS Program Management and Systems Engineering Division

IVHS Program Management and Systems Engineering Division (1) plans and coordinates FHWA's IVHS program, including budgeting, program planning, internal and external coordination, financial control and information management; (2) supports establishment of national compatibility, including system architecture, standards and spectrum acquisition; and (3) plans and coordinates activities aimed at addressing institutional and legal issues relating to IVHS development and deployment.

IVHS Operational Tests Division

The IVHS Operational Tests Division (1) manages IVHS operational test and priority corridors programs; (2) solicits and fosters partnerships for conducting operational tests among private companies, universities, State and local governments, and others; (3) formulates policy and budget recommendations for operational tests and IVHS corridors program; and (4) forms and leads teams with field office personnel and R&D to manage FHWA IVHS operational testing project responsibilities.

Traffic Management Systems Division

The Traffic Management Branch (1) develops program policies related to traffic operations and management designed to effectively mitigate urban congestion; (2) provides technical assistance in the identification and application of traffic management solutions; (3) provides leadership in IVHS technologies which are completed and ready for full operational status; and (4) promotes transportation system strategies to enhance urban mobility including demand management, incident management, and operational improvements.

The Traffic Performance Branch (1) develops and promotes new methodologies for measuring and evaluating the performance of traffic; (2) assists States in deploying mature commercial vehicle IVHS technologies aimed at improved traffic operations; (3) promotes and provides technical assistance in the use of traffic computer simulation and control software; (4) provides human factors support for traffic management, IVHS and advanced traffic systems; (5) promotes operational techniques for improving the mobility of elderly motorist and pedestrians.

Staff Specialty Areas: Office of Traffic Management and IVHS

IVHS Program Management and Systems Engineering Division (HTV-10)

Gary Euler — Division Chief (202) 366-2196

Cheryl Ashton — Division Secretary (202) 366-2196

Milt Heywood — Technical Program Advisor (202) 366-2182

- Focal point for initial contacts by public and private sector
- General knowledge of FHWA/DOT IVHS program and technical activities
- Administrative liaison with IVHS AMERICA
- Project Manager, Roadway Powered Electric Vehicle (California)
- Advanced Vehicle Control Systems Program coordinator (includes Automated Highway System 1997 demonstration)

Toni Wilbur — Program Management Team Leader (202) 366-2199

- Responsible for IVHS program development, monitoring, and coordination
- Performs IVHS budget preparation, justification, and tracking
- Conducts overall program management activities for IVHS, including coordination among major program areas and R&D/Operational Test projects
- Liaison for IVHS program-related efforts by external entities including IVHS AMERICA

Lee Simmons -Systems Engineering Team Leader (202) 366-8048

- Overall Program Manager for the nationwide IVHS architecture development program
 - Leader of the intermodal DOT Architecture Team
- Liaison to relevant external activity, including Automated Highway System definition/development and IVHS AMERICA Architecture Committee efforts

Cindy Elliott — Institutional and Legal Issues Team Leader . . . (202) 366-8707

- Overall Program Manager for the IVHS institutional and legal issues program, including public/private partnerships, interjurisdictional cooperation, user acceptance, environment, privacy, societal implications, contracting options and other legal matters
- Liaison to external activities for IVHS institutional and legal activities, including IVHS AMERICA

Mike Schagrin — Systems Engineer (202) 366-2180

- Performs task management/coordination for the IVHS architecture development program
- COTR, systems engineering support contract held by the Jet Propulsion Laboratory, and for the forthcoming contracts to be held by System Architecture teams
- Works closely with system engineering support staff in developing architecture functional requirements and evaluation criteria

Donna Kelly Rockwell — Transportation Specialist (202) 366-6751

- Provides support to IVHS program in budgeting, coordination, and financial management
- Maintains IVHS Management Information System
- COTR, support services contract for the IVHS program

Beverly Russell — Transportation Specialist (202) 366-2202

- Project Manager, IVHS Institutional Issues program dealing with legal, jurisdictional, marketing, organizational, and educational issues surrounding IVHS
- Assists with program management activities including budget and Congressional inquiries
- Contact for project on IVHS educational and staffing needs

George Beronio — Electrical Engineer (202) 366-6111

- Provides technical support to the IVHS architecture development effort in areas including communications, simulation modeling, and concurrent R&D
- COTR, Technical Review Team (consultant panel to the architecture program)
- Involved in various aspects of ATIS/ATMS research activities and operational tests

IVHS Operational Tests Division (HIV-PO)**George Schoene** — Chief (202) 366-6726**Maria Prince** — Division Secretary (202) 366-6726

- Concerned with general issues of IVHS Operational Tests and IV-IS Corridors programs
- Encourages promotion of IVHS technology
- Assists in forming IVHS partnership relationships for Operational Test projects and Corridors program
- Secretary, IVHS AMERICA Standards and Protocols Committee

Mike Halladay — Operational Tests Team Leader (202) 366-6503

- Leads teams established for implementation of IVHS Operational Tests and IVHS Corridors programs in Regions 1,3,4, and 6
- Project Manager for several Operational Test projects of national significance in the above regions
- Liaison with key regional staff regarding IVHS program policies and implementation procedures
- Participates in development of program policies, procedures, and requirements as a team member along with R&D, Traffic Management Division, and MITRE Corporation staff
- Project Manager, TRANSCOM Congestion Management Program

Bob Rupert - Operational Tests Team Leader (202) 366-2194

- . Leads teams established for implementation of IVHS Operational Tests and IVHS Corridor programs in Regions 5,7,8,9 and 10
- Provides technical analysis/assistance for development of IVHS program & projects
- Provides technical support on communications issues and issues related to advanced system hardware & integration
- COTR, TravTek Traffic Management Center contract
- . Project Manager, ADVANCE Project (Chicago)

Denise Bednar — CVO Team Leader (202) 366-6143

- Commercial Vehicle Operations (CVO) Coordinator
- . IVHS coordinator: HELP/Crescent, Advantage I-75, Oregon PASS, and other CVO Operational Tests
- Coordinator, CVO Institutional Issues Studies

Steve Clinger — Transportation Specialist (202) 366-2160

- . Focal point for rural IVHS activity
- . Project Manager, TravelAid and other operational tests
- Provides advice and assistance for the safety-related aspects of the IVHS program
- Secretary, IVHS AMERICA Advanced Rural Transportation Systems Committee

Matt Miller — Highway Engineer (202) 366-6479

- Provides technical assistance for the development of IVHS projects and programs, primarily in Regions 1 and 3
- Identifies needed IVHS activities and assists in establishing new Operational Tests
- Assists in the development of IVHS program policies, procedures, and requirements

Traffic Management Systems Division (HTV-30)**Sheldon Strickland** — Division Chief (202) 366-1993**Angela Price** — Division Secretary (202) 366-1993***Traffic Performance Branch (HTV-32) Staff*****vacant** — Chief (202) 366-2215

- Traffic Operations Evaluation Methods & Programs
- . Congestion & Transport Mobility Indices
- Traffic Systems Operator & Driver Performance
- Criteria for Application of Pre-IVHS Technologies for Transportation Mgmt
- Telecommunications Options for Augmenting Personal Transportation

Hal Lunenfeld — Engineering Psychologist (202) 366-2149

- Human Factors and Positive Guidance
- Special Traffic Control Requirements of Older Drivers
- Facility Requirements for Accommodating Pedestrians
- Training Needs and Programs for Urban Traffic Engineers
- Coordinator for FHWA Traffic Operations Core Curriculum

Daniel L. Schierer — Highway Engineer (202) 366-4672

- Expert Systems for Traffic Ops Applications including Incident Management
- Traffic Issues Related to Large and Heavy Trucks
- Telecommunications including Electronic Bulletin Boards
- Computerized Database Design
- User-Computer Interface Design of Traffic Simulation and Signal Optimization

Ronald Giguere — Highway Engineer (202) 366-2203

- Traffic Software Evaluation and Technical Assistance
- Congestion Management System Design and Implementation
- Support & Consultation on the Highway Capacity Manual and Companion Software
- Assessments of Congestion Reduction Techniques and Urban Emission Levels
- IVHS Benefits Assessments

Shui-Ying Wong — Highway Engineer (202) 366-2207

- TRAP-NETSIM Case Studies and Training Courses
- Transportation Software Distribution Centers
- Update of "Traffic Models Handbook" & Training Course
- Simulation of Urban Intersection and Interchange Operations
- Transition Strategies for Real-Time Adaptive Traffic Control
- Tech Assistance for Use & Evaluation of Simulation Models CORPLO and FRESIM

Claretta Duren — Transportation Spec. (202) 366-2219

- Support for Traffic Simulation Model, TRAP-NETSIM
- Support for Electronic Bulletin Board Traffic Conference
- Local Area Network Administration
- Traffic Management & Operations Applications of GIS
- Traffic Operations Technical Assistance Coordinator

Traffic Management Branch (HTV_31) Staff

Larry W. Dames — Branch Chief (202) 366-5465

- Traffic Operations & Management to Mitigate Urban Congestion
- Technical Assistance In Application of Operations Solutions
- IVHS Technologies Which Are Developing &/or Ready for Operation
- TSM Strategies To Enhance Mobility ITDM, IM, Oper. Improv, etc.)

Jerry Emerson — Highway Engineer (202) 366-2221

- Freeway Management Systems
- Incident Management
- High Occupancy Vehicle (HOV) Facilities
- IVHS Traffic Operations Specialist
- Traffic Management Training & Technical Assistance

Wayne Berman — Highway Engineer (202) 366-4069

- Transportation Systems Management (TSM)
- Transportation Demand Management (TDM)
- Ridesharing/HOV Systems
- Parking Management Strategies
- TDM Training & Technical Assistance

Raj Ohaman — Highway Engineer (202) 366-2200

- Traffic Control Systems (TCS)
- Traffic Management Quality Assurance
- Program Mgr/Traffic Control Demonstration Proj
- TCS Training & Technical Assistance

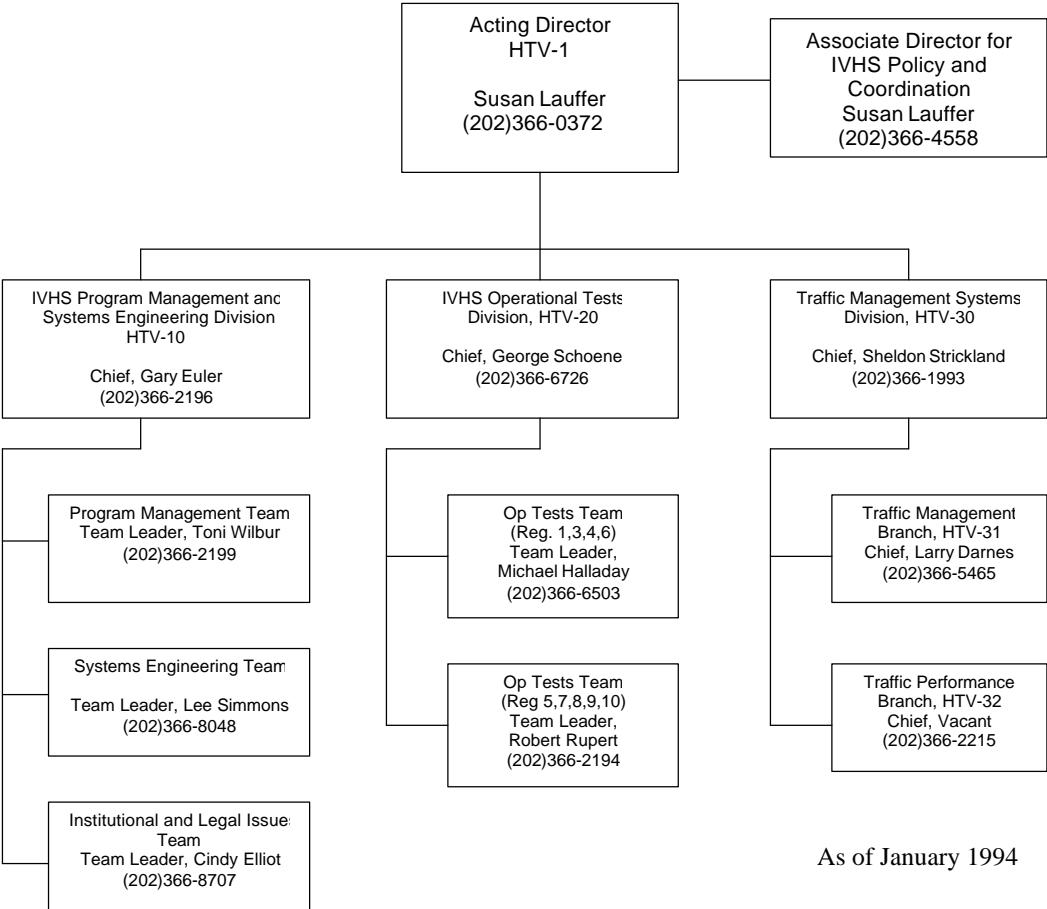
Shelley Lynch — Highway Engineer (202) 366-2184

- IVHS Early Deployment Program
- IVHS Deployment Plan
- Development of Training Aids for IVHS Deployment
-

Morris Oliver — Highway Engineer (202) 366-2251

- Freeway Management Systems
- Incident Management
- High Occupancy Vehicle (HOV) Facilities
- Traffic Management Training & Technical Assistance

Office of Traffic Management and Intelligent Vehicle-Highway systems (IVHS)



As of January 1994

Turner Fairbanks Research Center

6300 Georgetown Pike
HSR-1
McLean, VA 22101

Office of Safety and Traffic Operations Research and Development

Lyle Saxton — Director. (703) 285-2021

Intelligent Vehicle-Highway Systems Research Division

John MacGowan — Division Chief (703) 285-2027

Lawrence Powers — Deputy Division Chief (703) 285-2026

Alberto Santiago — Chief, Traffic Systems Branch (703) 285-2092

- Responsible for planning, developing, and executing the FHWA ATMS R&D program.
- Manager, Traffic Management Laboratory
- Leads the development of simulation models and support systems for ATMS traffic management centers.
- COTR, Real-Time, Traffic-Adaptive Signal Control for IVHS contract study.
- Chair, IVHS AMERICA, ATMS Subcommittee on Technology. Secretary, TRB Traffic Signal Systems Committee

Frank Mammano — Chief, Electronic Systems Branch (703) 285-2405

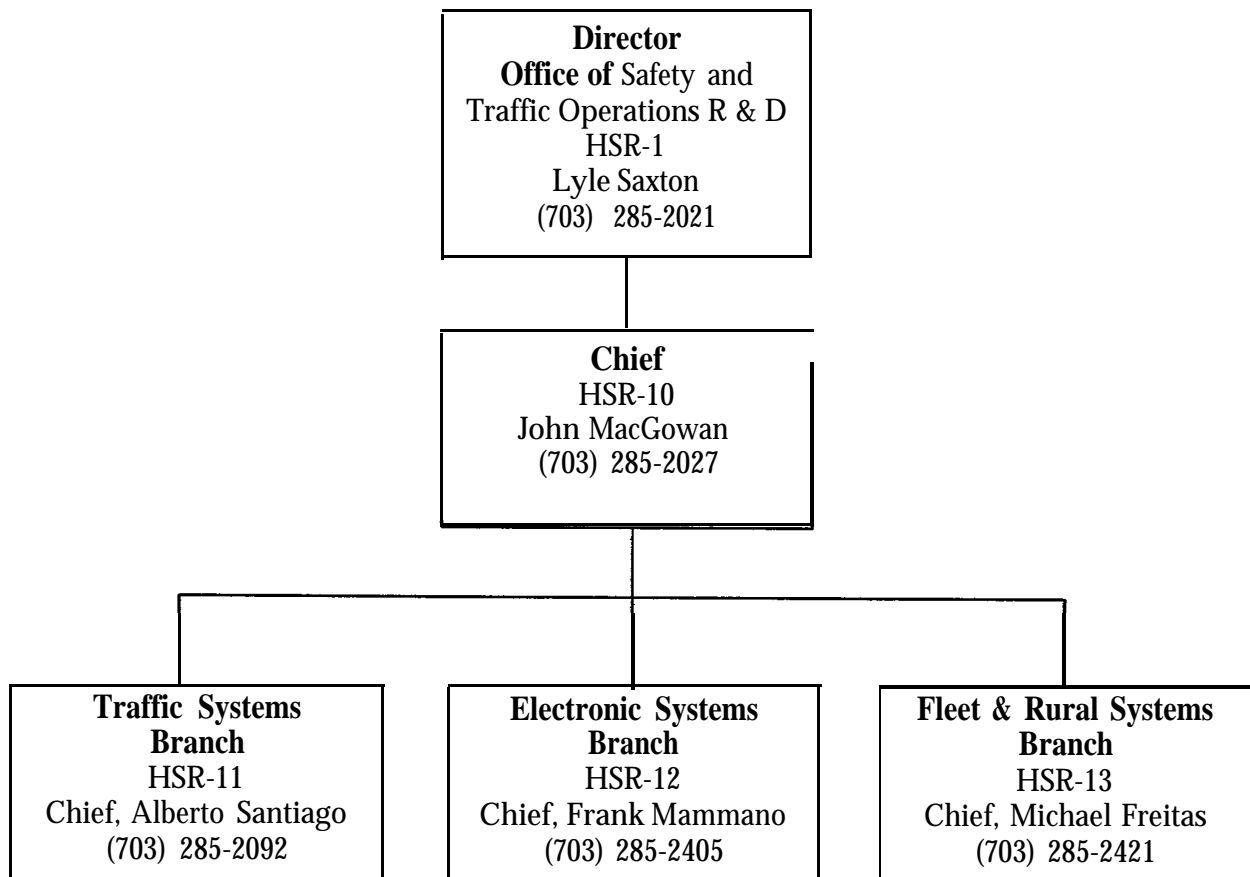
- Responsible for planning, developmg and conducting the FHWA IVHS ATIS & AVCS/AHS R&D programs and electronic and communication aspects of IVHS.
- Maintain and operate an in-house electronics laboratory which provides electronic instrumentation and testing support services to the division, other laboratories at TEHRC, and other elements within R&D and FHWA.
- COTR, TravTek evaluation contract and Pathfinder system design.
- Responsible for developing a national spatial database and link identification for IVHS.
- Responsible for monitoring ATIS, AVCS/AHS and communication activities associated operational field tests.
- Chairman of the MI-ISA AMERICA Task Force on Communications.
- Secretary of the ATIS conunittee of IVHS AMERICA.
- Member of the TRB and AASHTO committees on communication.
- Member of the DOT/DOD Navigation Working Group.
- Member of the DOT/DOD GPS Working Group representing the DOT Land Modes.
- Chairman of the Land Modes subcommittee for GPS requirements.
- Member of the NTIA and hoc 193 on Traveler Information Stations/Highway Advistory Radio in the expanded AM Broadcast Band.

- Member of the National Radio System Committee of the National Association of Broadcasters to develop the North American Radio Data Broadcast System Standard.

Michael Freitas — Chief, Fleet & Rural Systems Branch (703) 285-2421

- Responsible for overseeing the planning, initiating, and monitoring all research in commercial vehicle and rural IVHS.
- Responsible for the establishment and monitoring of an operational test evaluation support contract.
- Responsible for the IVHS-IDEA Program.
- Responsible for the establishment and monitoring of the IVHS Research Centers of Excellence.

Intelligent Vehicle-Highway Systems (IVHS) Research Division



The IVHS/CVO Program

Background

Under the Department of Transportation's (DOT) National IVHS Priorities, the Commercial Vehicle Operations (CVO) program holds particular promise in helping to achieve renewed economic prosperity through the creation of new technologies and consumer markets, the automation of existing requirements, as well as the conversion and use of applicable defense technologies for civilian purposes.

DOT believes that CVO services will be among the first IVHS technologies deployed because of the expected cost savings and benefits to both States and carriers. CVO is a fundamental component of the IVHS program, and application of IVHS technology to commercial vehicle operations will foster the creation of an environment in which the motor carrier industry, and the State and Federal agencies that regulate them, will operate more efficiently and effectively. The CVO program is essential to the development of specific IVHS technologies to improve highway safety and productivity for motor carriers and motor carrier operators.

In the course of the development of the National IVHS Program Plan, the CVO program is a major component in the creation of a seamless intermodal transportation system which will move cargo from truck to rail to port in the safest, most expeditious manner.

Objectives

The IVHS/CVO Program is designed to create a safer, more efficient highway environment for commercial vehicle carriers, drivers, and the general driving public. Some of the major program objectives are:

- . To demonstrate, by 1997, a national information network for commercial vehicles where safe and legal vehicles can be electronically cleared at main-line speeds, thus bypassing weigh stations and inspection facilities.
- The automation of the Motor Carrier Safety Assistance Program (MCSAP) roadside safety inspection sites. This objective will enable enforcement personnel to access better information for screening, targeting, and inspecting more vehicles and drivers, thus increasing the number of vehicles inspected annually and increasing safety compliance and safe operations.
- To streamline the current regulatory, administrative, and enforcement practices, and allow carriers and States to increase their safety and productivity by significantly reducing delays and unnecessary paperwork.
- To automate the mileage collection and fuel tax reporting processes used by interstate carriers, thus significantly reducing annual processing costs for carriers and states.

IVHS/CVO User Services

There are six areas of service which the IVHS/CVO program will concentrate on developing:

- The Commercial Vehicle Electronic Clearance Service
- The Automated Roadside Safety Inspection Service
- The Onboard Safety Monitoring Service
- The Commercial Vehicle Administrative Processes Service
- The Hazardous Materials Incident Notification System
- The Commercial Fleet Management Service

IVHS/CVO Task Force

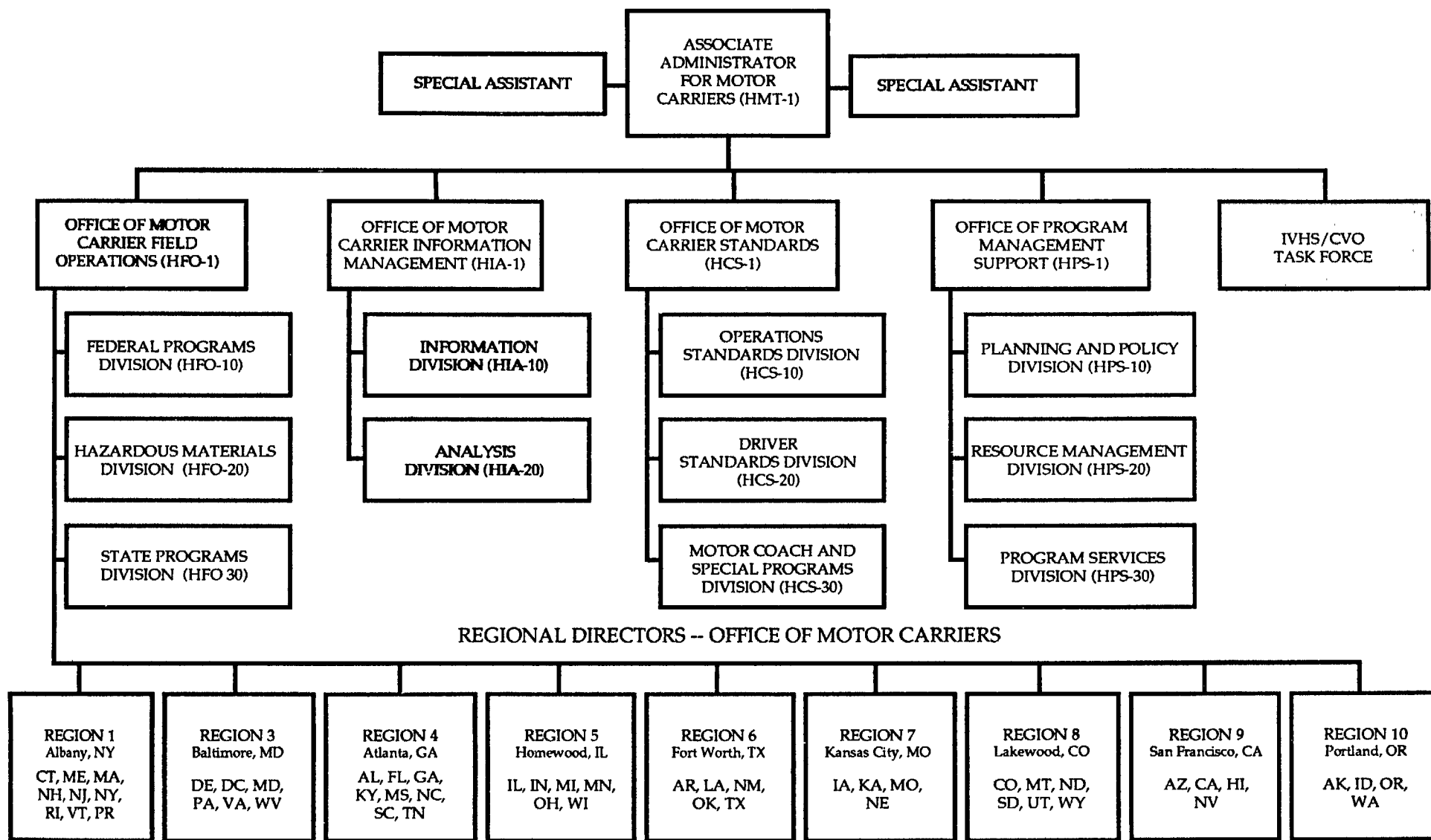
The IVHS/CVO Task Force was established by the Associate Administrator for Motor Carriers as a vehicle for the coordination of the IVHS components of the CVO program in the Federal Highway Administration (FHWA). The Task Force works closely with the Traffic Management and Research & Development staffs — within the FHWA Office of Motor Carriers and its field facilities — to coordinate and direct all IVHS activities related to Commercial Vehicle Operations. The role of the IVHS/CVO Task Force is to coordinate and manage the IVHS/CVO program including the research, testing and demonstration of related IVHS/CVO technology applications.

The Task Force members also work with the States, carriers and other affected parties to gain their understanding of, and support for, the IVHS/CVO program.

The IVHS/CVO Task Force is responsible for the development of a detailed IVHS/CVO Program plan, in cooperation with IVHS AMERICA and other partner organizations, as it relates to the long-term needs of CVO.

The Task Force has a 6-month life span. A separate and permanent CVO unit is expected to be established as part of a broader reorganization in the Office of Motor Carriers.

FEDERAL HIGHWAY ADMINISTRATION OFFICE OF MOTOR CARRIERS



CVO Task Force Full Time Members

Name	Phone # Fax #	Area of expertise
Steve Crane	366-2952 366-7908	Task Force Leader
Doug McKelvey	366-1861 366-7298	Program Management, Operational Tests, Electronic Clearance
Jeff Loftus	366-4516 366-7298	Cost/Benefit Analysis, Fleet Management, Institutional Issues
Bill Mahorney	366-6515 366-7908	Transportation Plans, Safety Coordination
Jeff Van Ness	366-6236 366-7298	Onboard Safety Monitoring, Driver Fatigue
Anne Doty	366-8577 366-7908	IVHS National Program Plan, Outreach
Zeborah English	366-0398	Outreach, Marketing
Mary White	366-0950 366-7908	Secretary, Program Assistant, Budget

CVO Task Force Part Time Members

Name	Phone # Fax #	FHWA office, area of expertise
Dick Henderson	301-564-16223 301-564-0588	HFO-CVSA* , Outreach, Education, Planning
Dee Rose	301-564-1623 301-564-0588	HFO-CVSA* , Outreach, Education, Planning
Paul Alexander	366-5881 366-7908	HFO , Automated Roadside Inspection Coordinator
Lee Jackson	366-4415 366-7908	HFO , CVO Hazardous Materials Coordinator
Dale Sienicki	366-9039 366-7908	HFO , Safety Fitness, Volpe Contract, CVIS
Bonnie Bass	366-0089 366-7298	HIA , CVO Credentials Specialist, CVIS
Tom Hillegass	366-4023 366-7298	HIA , MIS specialist for Electronic Clearance and 100 MCSAP Sites
Tom Klimek	366-2212 366-7298	HIA , CVO Size and Weight Specialist
Mike Freitas	703-285-2421	R&D , CVO R&D
Mike Curtis	703-285-2991	R&D , CVO Architecture
Denise Bednar	366-6143	HTV , Liaison to other FHWA/IVHS office for ATMS, ATIS, Opt Tests

FHWA Regional Offices

REGION 1 (7:30 a.m.-4:00 p.m.)

John G. Bestgen, Jr.
Regional Administrator

Leo W. O'Brien Federal Building
Clinton Avenue & North Pearl Street
Room 719
Albany, NY 12207
518-472-6476

(vacant), Deputy Regional
Administrator

518-472-6477

Stephen L. Crane, Regional Director
of Motor Carriers

518-472-7509

Jonathan McDade, IVHS Engineer

518-472-4253

REGION 3 (7:45 a.m.-4:15 p.m.)

David S. Gendell
Regional Administrator

George H. Fallon Federal Office Building
31 Hopkins Plaza, Room 1633
Baltimore, MD 21201
410-962-0093

Joseph S. Toole, Deputy Regional
Administrator

410-962-2362

John Steinhoff, Regional Director
of Motor Carriers

410-962-2362

Jim Robinson, IVHS Engineer

410-962-3815

Tom Jacobs, IVHS Engineer

410-962-0091

REGION 4 (7:45 a.m.-4:15 p.m.)

Leon N. Larson

1720 Peachtree Road N.W., Suite 200
Atlanta, GA 30367
404-347-4078

Henry Rentz,
Deputy Regional Administrator

404-347-4070

Darrell C. Gregory, Regional
Director of Motor Carriers

404-347-4049

Patricia Harrison, IVHS Engineer

404-347-4075

Eddy Bruce, IVHS Engineer

404-347-4075

REGION 5 (7:30 a.m.-4:15 p.m.)

Herbert R. Teets
Regional Administrator

18209 Dixie Highway
Homewood, IL 60430-2294
708-206-3186

Vincent F. Schimmoller,
Deputy Regional Administrator

708-206-3186

Joseph J. Fulnecky, Regional Director of Motor Carriers	708-206-3186
Marty Monahan, IVHS Engineer	708-206-3218

REGION 6 (8:00 a.m.-4:30 p.m.)

Wesley S. Mendenhall Jr. Regional Administrator	819 Taylor Street Fort Worth, TX 76102 817-334-4393
--	---

Dale L Wilken, Deputy Regional Administrator	817-334-4393
---	--------------

Lester D. Friesen, Regional Director of Motor Carriers	817-334-3225
Greg Jones, IVHS Engineer	817-334-4379

REGION 7 (7:30 a.m.-400 p.m.)

Vohner K. Jensen Regional Administrator	6301 Rockhill Road P.O. Box 419715 Kansas City, MO 64141-6715 816-926-7490
--	---

Archie L Bedford, Director, Engineering and Operations	816-926-5235
---	--------------

William O. Hester, Regional Director of Motor Carriers	816-926-7896
Bruce Baldwin, IVHS Engineer	816-926-7421

REGION 8 (7:45 a.m.-4:15 p.m.)

Louis N. MacDonald Regional Administrator	555 Zang Street, Room 400 Lakewood, CO 80228 303-969-6722
--	---

Marvin I. Espeland, Deputy Regional Administrator	303-969-6722
--	--------------

William P. Jensen, Regional Director of Motor Carriers	303-969-6722
CP Damon, IVHS Engineer	303-969-6712

REGION 9 (2:45a.m.-4:15 p.m.)

Tom Ptak Regional Administrator	211 Main Street Room 1100 San Francisco. CA 94105 415-744-2639
------------------------------------	---

Ervin Poka Jr., Special Assistant to Regional Administrator	415-744-2647
--	--------------

Nicholas R. Walsh, Regional Director of Motor Carriers	415-744-2645
---	--------------

Jeff Lindley, IVHS Engineer	415-744-2659
Jackie Landsman, IVHS Engineer	415-744-2659

REGION 10 (7:00 a.m.-5:45 p.m.)

Jerald P. Clark
Regional Administrator

KOIN Center, Suite 600
222 S.W. Columbia Street
Portland, OR 97201
503-326-2053

Leon J. Witman Jr., Deputy
Regional Administrator
Clinton O. Mosby, II, Regional
Director of Motor Carriers
Ed Fischer, IVES Engineer

503-326-2048

503-326-4902

503-326-2071

list of FHWA Division Office Addresses

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Mr. Joe D. Wilkerson
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Montgomery, AL 36117-2018

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Mr. Robert E. Ruby
Administrator
709 W. Ninth Street, Room 443
Juneau, AK 99802-1648

Arizona (HDA-AZ)
Mr. Edward A. Wueste
Administrator
234 N. Central Ave., Suite 330
Phoenix, AZ 8504

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Mr. William D. Richardson
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700 West Capitol Avenue
Little Rock, AR 72201

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Mr. Roger E. Borg
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801 I Street
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Mr. George H. Osborne
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555 Zang Street, Room 250
Lakewood, CO 80228

Connecticut (HDA-CT)
Mr. Gary Hamby
Administrator
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Hartford, CT 06103

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Mr. John J. Gilbert
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Dover, DE 19901-6726

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Mr. Arthur J. Mill
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Mr. Jennings R. Skinner
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227 N. Bronough St., Room 2015
Tallahassee, FL 32301

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Mr. Larry Dreihaup
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1720 Peachtree Road NW., Suite 300
Atlanta, GA 30367

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Mr. William R. Lake, Jr.
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Boise, ID 83703

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Mr. Lyle P. Renz, Administrator
3250 Executive Park Drive
Springfield, IL 62705

Indiana (HDA-IN)
Mr. Arthur A. Fendrick
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Indianapolis, IN 46204

Iowa (HDA-IA)
Mr. Hubert A. Willard
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Ames, IA 50010

Kansas (HDA-KS)
Mr. Robert J. Deatrick
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Topeka, KS 66611-2237

Kentucky (HDA-KY)
Mr. Paul E. Toussaint
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John C. Watts Federal Building
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Frankfort, KY 40602

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Mr. William A. Sussman
Administrator
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Baton Rouge, LA 70801

Maine (HDA-ME)
Mr. Paul Lariviere
Administrator
Edmund S. Muskie Federal Building
40 Western Avenue, Room 614
Augusta, ME 04330

Maryland (HDA-MD)
Mr. A. Porter Barrows
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The Rotunda, Suite 220
711 West 40th Street
Baltimore, MD 21211

Massachusetts (HDA-MA)
Mr. Donald E. Hammer
Administrator
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Cambridge, MA 02142

Michigan (HDA-MI)
Mr. A George Ostensen
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Lansing, MI 48933

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Mr. Charles R. Foslien
Administrator
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Seventh & Robert Streets
St. Paul, MN 55101

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Missouri (HDA-MOB)
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Jefferson City, MO 65101

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Helena, MT 59626-0056

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Mr. Charles A. Culp
Administrator
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Mr. Gerald L. Eller
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Mr. Charles J. Nemmers
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Salem, OR 97301

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Mr. Manuel A. Marks
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Harrisburg, PA 17108

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Nashville, TN 37228

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Montpelier, VT 05602

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Mr. James M. Tumlin
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400 N. 8th Street
Richmond, VA 23240

Virgin Islands (HVI-01)
Ms. Charlotte Amalie
U.S. Federal Building & Courthouse,
Room 281
St. Thomas, VI 00801

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Suite 501, Evergreen Plaza
711 South Capitol Way
Olympia, WA 98501

West Virginia (FDA-WV)
Mr. Billy R. Higginbotham
Administrator
550 Eagan Street, Suite 300
Charleston, WV 253014

Wisconsin (FDA-WI)
Mr. James E. St. John
Administrator
4502 Vernon Boulevard
Madison, WI 53705-4905

Wyoming (FDA-WY)
Mr. Frederick A. Behrens
Administrator
1916 Evans Avenue
Cheyenne, WY 82001-3764

Federal Transit Administration (FTA)

Administrator: Gordon J. Linton
Deputy Administrator: Grace Crunican

The Federal Transit Administration (FTA), which carries out the Federal mandate to improve public mass transportation, is one of nine operating administrations or agencies within the U.S. Department of Transportation. It is the principal source of Federal financial assistance to America's communities for the planning, development, and improvement of public transportation systems.

This assistance is provided through a variety of programs under the Federal Transit Act, as amended. FTA circulars, which provide comprehensive information on the application process for FTA assistance, are available. To obtain such information, contact the nearest FTA Regional Office, or the FTA Office of Administration, Administrative Services Division, 400 Seventh Street, S.W., Washington, D.C., 20590, telephone number (202) 366-4865. Pamphlets and written material can also be obtained from the FTA Office of Public Affairs, 400 Seventh Street, S.W., Washington, DC. 20590, telephone number (202) 366-4043.

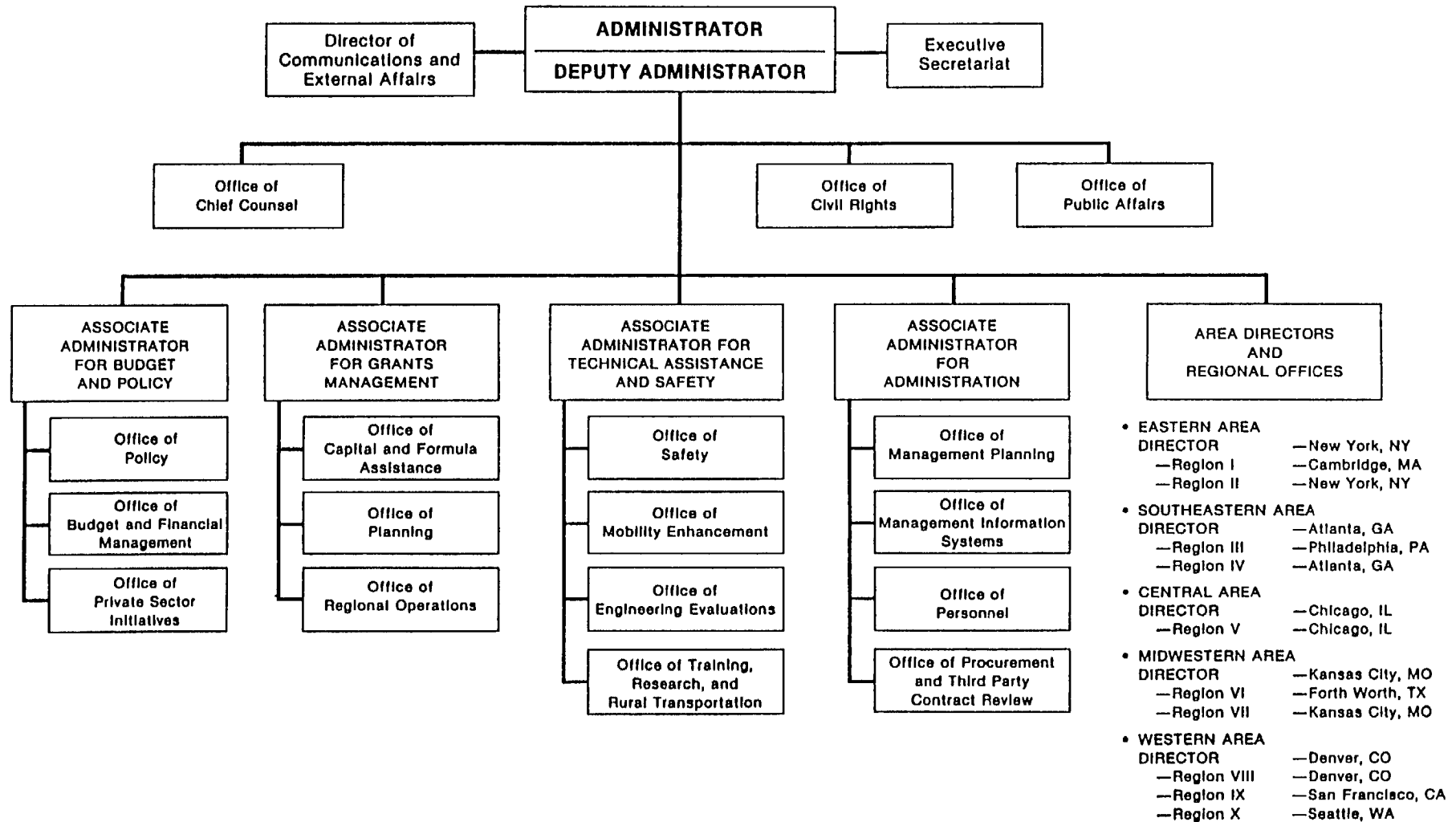
Advanced Public Transportation Systems Program

FTA has created the Advanced Public Transportation Systems (APTS) program as part of the U.S. Department of Transportation initiative in Intelligent Vehicle Highway Systems (IVHS). Through APTS, FTA funds research, development, and operational tests of advanced navigation, information, and communications technologies to improve public transit systems. These technologies include advanced communications, passenger information, fare media, and vehicle location. The goal of APTS is the development of a readily accessible body of knowledge about technologies that enhance public transportation and the demonstration of those technologies in operating models. Projects in the APTS program are designed to increase transit use and ridesharing, improve the safety and security of transit operations, reduce operating costs, increase system revenues, conserve energy, and assist in responding to such legislative mandates as the Americans with Disabilities Act and the Clean Air Act.

Objectives and Approach

The APTS program is divided into three major components Smart Traveler, Smart vehicle, and Smart Intermodal Systems. Functionally, each component consists of four categories: research, user requirements and technical assistance, operational tests, and project evaluation cross-cutting studies. Individual projects support each area so that program goals are attained.

FEDERAL TRANSIT ADMINISTRATION



Accomplishments to Date

- Developed a Vehicle Network Standard to integrate all bus electronic systems, including communications, electronic fare collection, passenger information, passenger counting, and vehicle location through a single wiring harness. Current systems are wired separately, adding weight, maintenance complexity, and substantial installation costs. The standard has been adopted by SAE (Society of Automotive Engineers) and is now being internationally accepted.
- Conducted an evaluation of the technical performance and effectiveness of the Denver Regional Transportation District's new district-wide communications system, which combines communications and Smart Vehicle technologies. The evaluation is being performed by Sandia National Laboratories.
- Assisted Dallas Area Rapid Transit by evaluating a Global Positioning System (GPS) receiver and recommending changes. These changes resulted in a system offering greater location accuracy and reliability.
- Awarded a Phase II SBIR project to test advanced fare collection technology, including smart cards that can be remotely read and debited thereby increasing throughput and passenger convenience.
- Drafted five, and assisted with the development of two, of the 27 IVHS User Services, which form part of the DOT IVHS Program Plan.
- Assisted Houston Metro in developing a Smart Traveler concept which is being implemented on the I-10 West and I-45 North corridors. This will divert drivers of single occupant vehicles to transit and Carpools.
- Developed and published *APTS: Evaluation Guide* through the Volpe Center. The document provides a common evaluation format, data collection and analysis procedures.
- Published the APTS State-of-the-Art, State-of-the-Art Update '92 and State-of-the-Art Update '94, compendiums of advanced technology in public transportation, which have assisted more than 50 communities in developing APTS projects.

Planned for FY 1995

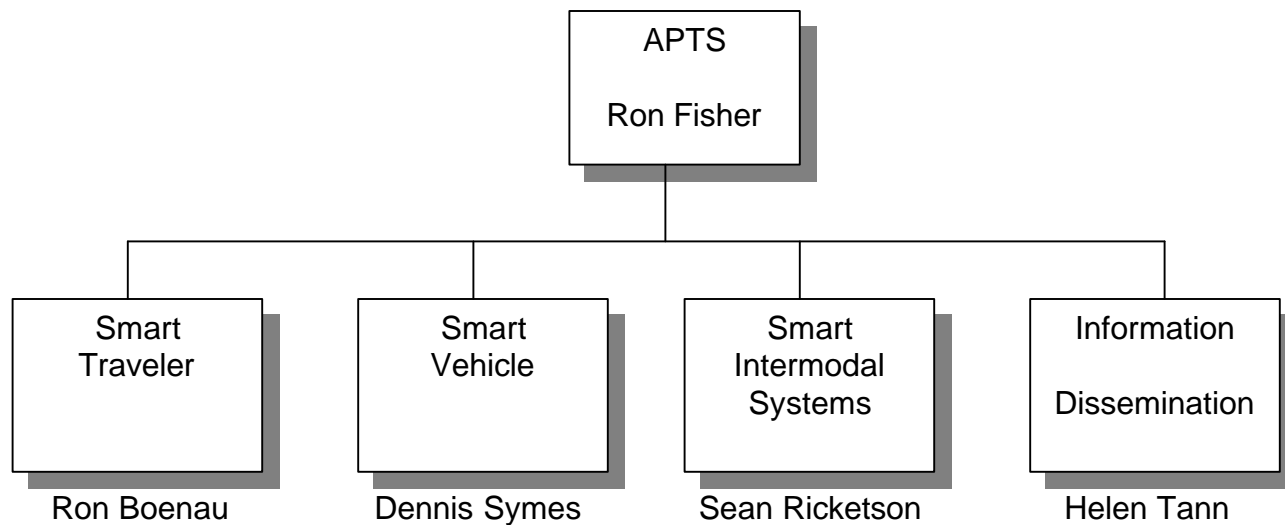
- **Research.** Activities will include human factors, advanced communication and system component studies.
- **User Requirements and Technical Assistance.** This project will develop user requirements to help transportation providers define technical requirements that must be addressed in preparing specifications for APTS technologies.
- **Operational Tests.** Several operational tests are planned to test and evaluate innovative systems. Proposed tests include the California Smart Traveler concept, Transit Route Deviation, Rural Mobility Management, Radio Frequency Fare Media, and Multi-Use Smart Cards.
- **Project Evaluation/Cross Cutting Studies.** These studies are an assessment of operational tests using a standardized evaluation plan. Evaluations will

collect and analyze data on system performance and permit ready comparison among test sites and technologies.

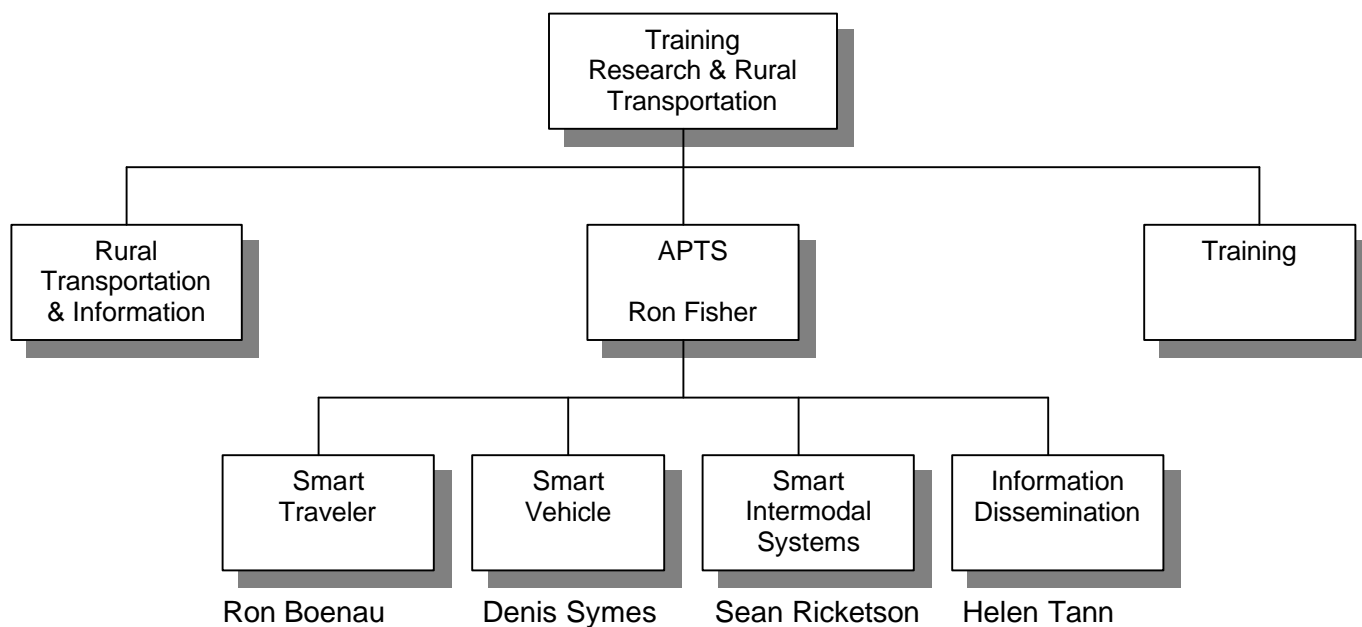
APTS Budget (Millions)

FY1992	FY1993	FY1994
\$5.4	\$3.1	\$3.0

Advanced Public Transportation Systems Organization



Office of Training, Research and Rural Transportation



FEDERAL TRANSIT ADMINISTRATION

STAFF SPECIALTY AREAS: Office of Training, Research and Rural Transportation

Division of Advanced Public Transportation Systems-Transit IVHS Activities

Ron Fisher — Division Chief (Acting) (202) 366-4995

Aletha Goodine — Division Secretary (202) 366-4995

Denis Symes — Senior Systems Engineer (202) 366-0232

Responsibility Areas

- Smart Vehicle and Facilities
- Vehicle Electronics Systems including Communications Systems, Vehicle Location, Passenger Counters, etc.
- Electronic Standards, including VAN (J-1708)
- FTA IVHS Systems Architecture
- Operational test activities in Denver, Dallas, Houston & New York
- APTS systems engineering activities

Ron Boenau — Senior Program Manager (202) 366-0193

Responsibility Areas

- Smart Traveler Technology
- Electronic Information presented to passengers at kiosks, home, offices
- Operational test activities in Medford (OR) & Northern Virginia
- Operational tests in California
- Mobility management activities
- APTS program management

Sean Ricketson — Program Manager (202) 366-6678

Responsibility Areas

- Smart Intermodal Systems
- Advanced Fare Collection Systems
- Operational test activities in Minneapolis, Wilmington, Chicago, Chattanooga, Delaware County

HelenTann-Information Dissemination Manager (202) 366-0207

Responsibility Areas

- Information dissemination
- APTS Committee liaison
- Project status reports

FTA Regions

REGION I-BOSTON

55 Broadway, Suite 920
Kendall Square
Cambridge, Massachusetts 02142
(617) 494-2055
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont

REGION II-NEW YORK

26 Federal Plaza, Suite 2940
New York, New York 10278
(212) 264-8162
New Jersey, New York, and Virgin Islands

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1760 Market Street, Suite 500
Philadelphia, Pennsylvania 19103
(215) 656-6900
Delaware, District of Columbia, Maryland, West Virginia, Pennsylvania, and Virginia

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1720 Peachtree Road, N.W.
Suite 400
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55 East Monroe Street
Suite 1415
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819 Taylor Street
Suite 9A32
Fort Worth, Texas 76102
(817) 334-3787
Arkansas, Louisiana, New Mexico, Oklahoma, and Texas

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6301 Rockhill Road
Suite 303
Kansas City, Missouri 64131
(816) 926-5053
Iowa, Kansas, Missouri, and Nebraska

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Columbine Place
216 Sixteenth Street
Suite 650
Denver, Colorado 80202
(303) 844-3242
Colorado, Montana, Utah, North Dakota, South Dakota, Wyoming,
Nevada, and Arizona

REGION IX-SAN FRANCISCO

211 Main Street
Suite 1160
San Francisco, California 94105
(415) 744-3133
American Samoa, California, Guam, and Hawaii,

REGION X-SEATTLE

Jackson Federal Building
915 Second Avenue
Suite 3142
Seattle, Washington 98174
(206) 553-4210
Alaska, Idaho, Oregon, and Washington

National Highway Traffic Safety Administration

Acting Administrator: Christopher A. Hart

The National Highway Traffic Safety Administration (NHTSA) was established by the Highway Safety Act of 1970 as the successor to the National Highway Safety Bureau to carry out safety programs under the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966. NHTSA also carries out consumer programs established by the Motor Vehicle Information and Cost Savings Act, as amended.

NHTSA's mandate is to reduce deaths, injuries, and economic losses resulting from motor vehicle crashes. This is accomplished by setting and enforcing safety performance standards for motor vehicles, and through grants to state and local governments to enable them to organize, develop, and implement their highway safety programs more effectively. NHTSA investigates safety defects in motor vehicles, sets and enforces fuel economy standards, provides leadership to the states and local communities to reduce the threat of drunk drivers, promotes the use of safety belts, child safety seats and automatic protection, investigates odometer fraud, establishes and enforces vehicle theft regulations, and provides consumer information on motor vehicle safety and the crashworthiness of new cars. NHTSA also conducts research on driver behavior and traffic safety, and develops the most efficient and effective means of bringing about safety improvements.

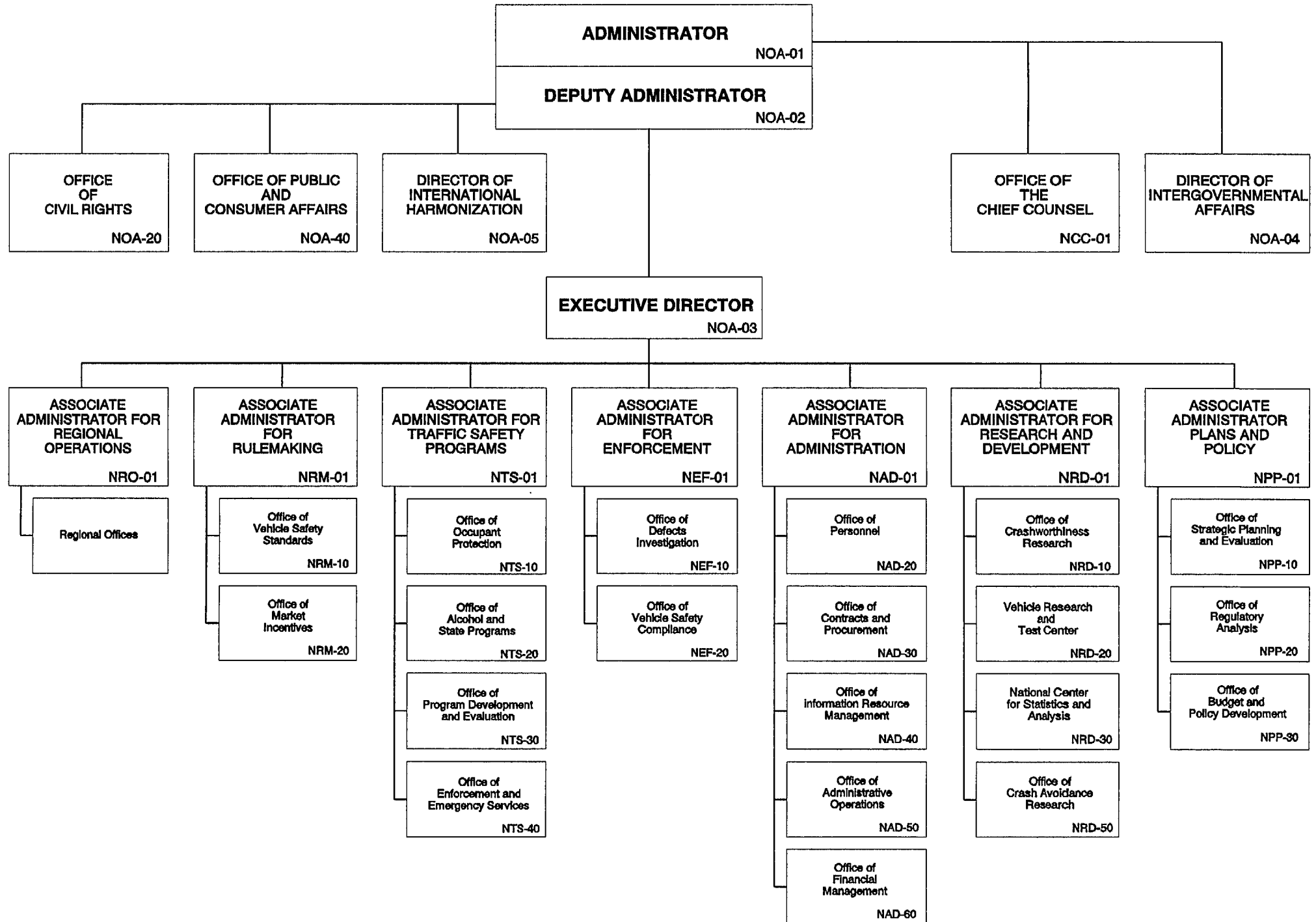
NHTSA procures research, development, test and evaluation services aimed at establishing safety standards for motor vehicles in interstate commerce, reducing accidents involving motor vehicles and reducing the deaths and injuries occurring in such accidents.

NHTSA contracts with private industry, educational institutions, and non-profit organizations for studies involving crash protection, crash avoidance, and crash survivability characteristics of vehicles, and for the test and evaluation of vehicle components and accessories.

All NHTSA procurement activities are administered by its Washington, D.C. headquarters:

National Highway Traffic Safety Administration
Office of Contracts and Procurement (NAD30)
400 7th Street, S.W.
Washington, DC. 20590
Telephone: (202) 366-0607

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION



IVHS in NHTSA - Status Report

The NHTSA IVHS program made significant progress in 1993 in implementing the agency's strategic plan to facilitate development and early deployment of cost-effective, user-friendly collision avoidance systems and to ensure no loss of safety as these systems are introduced into motor vehicles.

The program includes an expanding crash avoidance knowledge base; development of a vital set of research tools, including the National Advanced Driving Simulator; identification of crash avoidance opportunities; examination of key human factors and system design issues; and development of performance specifications for crash avoidance products and systems. These specifications will define performance characteristics in engineering and human factors terms and will help guide product development toward achievement of maximum safety potential.

The most significant accomplishments were the award of four multi-year contracts worth \$16.5 million to develop performance guidelines for collision avoidance systems, the award of the competitive design contracts for the National Advanced Driving Simulator (NADS), and the impending award of cooperative agreement with multiple industrial partners to accelerate the development of needed enabling technologies and/or collision avoidance systems.

The NHTSA Strategic Plan is comprised of five major elements. Each element is described below in the context of on-going projects contributing to the element goals.

Research Tools and Knowledge Base — The agency has defined goals for obtaining the research and analysis tools necessary to evaluate crash avoidance concepts and products and using these tools to develop a greatly expanded knowledge base of driver-vehicle performance and behavior needed to support safety system development. These tools/data are vital to understanding and documenting the safety benefits and potential liabilities associated with the design and deployment of IVHS products.

- The Oak Ridge National Laboratory is developing a portable driver performance data acquisition system for acquiring driver-vehicle performance data in-situ
- The University of Michigan Transportation Research Institute is developing a data acquisition/analysis system which can be used to characterize the vehicle motion environment, i.e., quantify normal vehicle motion in traffic relative to the other vehicles present on the roadway.
- The Jet Propulsion Laboratory is assessing the needs for a variable dynamic testbed vehicle for use in supporting IVHS, AHS, and NADS.
- Design teams led by TRW and Contraves are developing competitive designs for the National Advanced Driving Simulator (NADS). The team with the winning design will be selected to construct the NADS.

- Battelle is developing a workload assessment protocol for use in establishing today's baseline workload and in evaluating the effects of the addition of high technology systems on driver safety performance.
- COMSIS is identifying requirements for effective in-vehicle warning system design. A draft guideline document has been completed.
- Millitech Corporation is assessing the potential health hazard from IVHS-induced electro-magnetic radiation resulting from the widespread usage of IVHS collision avoidance systems.
- Catholic University is addressing crash avoidance and the older driver, i.e., analyzing their crash experience, assessing their capabilities/limitations, and evaluating design features to ensure safety while maintaining their mobility

Defining Crash Avoidance Opportunities — NHTSA is helping to guide the development of crash avoidance technology by identifying the types of countermeasures that are likely to give major benefit to the public. By careful analyses of the precrash circumstances associated with various crash modes, critical driving hazards can be identified. Countermeasures that address these hazards can then be specified in performance terms that match real needs.

- A series of reports have been published (or are currently being published) characterizing the following crash types rear-end, backing, and lane change. In review are reports addressing single-vehicle run-off-road and intersection crashes. Planned reports will deal with head-on and drowsy drivers. For each crash type, two reports are prepared — a problem size assessment and statistical description and a countermeasure assessment.

Demonstrating Proof of Concept — A key responsibility of NHTSA is to demonstrate that advanced technology can practicably enhance the crash avoidance performance of motor vehicles. The agency is currently developing performance guidelines for systems to address the following crash types.

- Lane change, merging and backing collisions (TRW)
- Rear-end collisions (Frontier Engineering)
- Intersection collisions (Calspan)
- Roadway departure collisions (Carnegie-Mellon University)
- Vision enhancement system (Carnegie-Mellon Research Institute)
- Detection of driver drowsiness (Virginia Polytechnic Institute and State University)
- Systems to automatically notify emergency medical services (EMS) dispatcher of the occurrence and location of a crash (Johns Hopkins Applied Physics Laboratory)

Facilitating Commercial Development — Public benefits come only through actual commercialization of safety-effective products. NHTSA is working with industry to facilitate the development and early deployment of collision avoidance systems.

NHTSA is in the final negotiation stages for awarding five cooperative agreements with industry partners in the following areas:

- Human factors aspects of intelligent cruise control
- Forward crash avoidance systems
- Forward looking radar sensors
- Vehicle-based lane detection
- Automotive braking for heavy vehicles

Assessing Safety of Other Systems — There are many IVHS concepts which entail functions other than crash avoidance, but nevertheless influence the driving task. A fundamental goal of this work is to ensure that mobility- and productivity-enhancing systems do not degrade motor vehicle safety.

NHTSA continues to work with FHWA to ensure that systems for improving mobility and productivity do not degrade motor vehicle safety.

- TravTek
- TravelAid
- ADVANCE
- FAST-TRAC

NHTSA IVHS Funding

FY 1993 \$9.024M*

FY 1994 \$14.5M**

FY 1995 \$17.271MY***

*\$ 2M from FHWA

**\$ 7M from FHWA

***\$10M from FHWA

National Highway Traffic Safety Administration Office Of Crash Avoidance Research

William A. Leasure, Jr., Director
Donna J. Stenski, Secretary

Simulator Project Staff (NRD-51)

H. Keith Brewer, Program Manager
John M. Machey, Mechanical Engineer

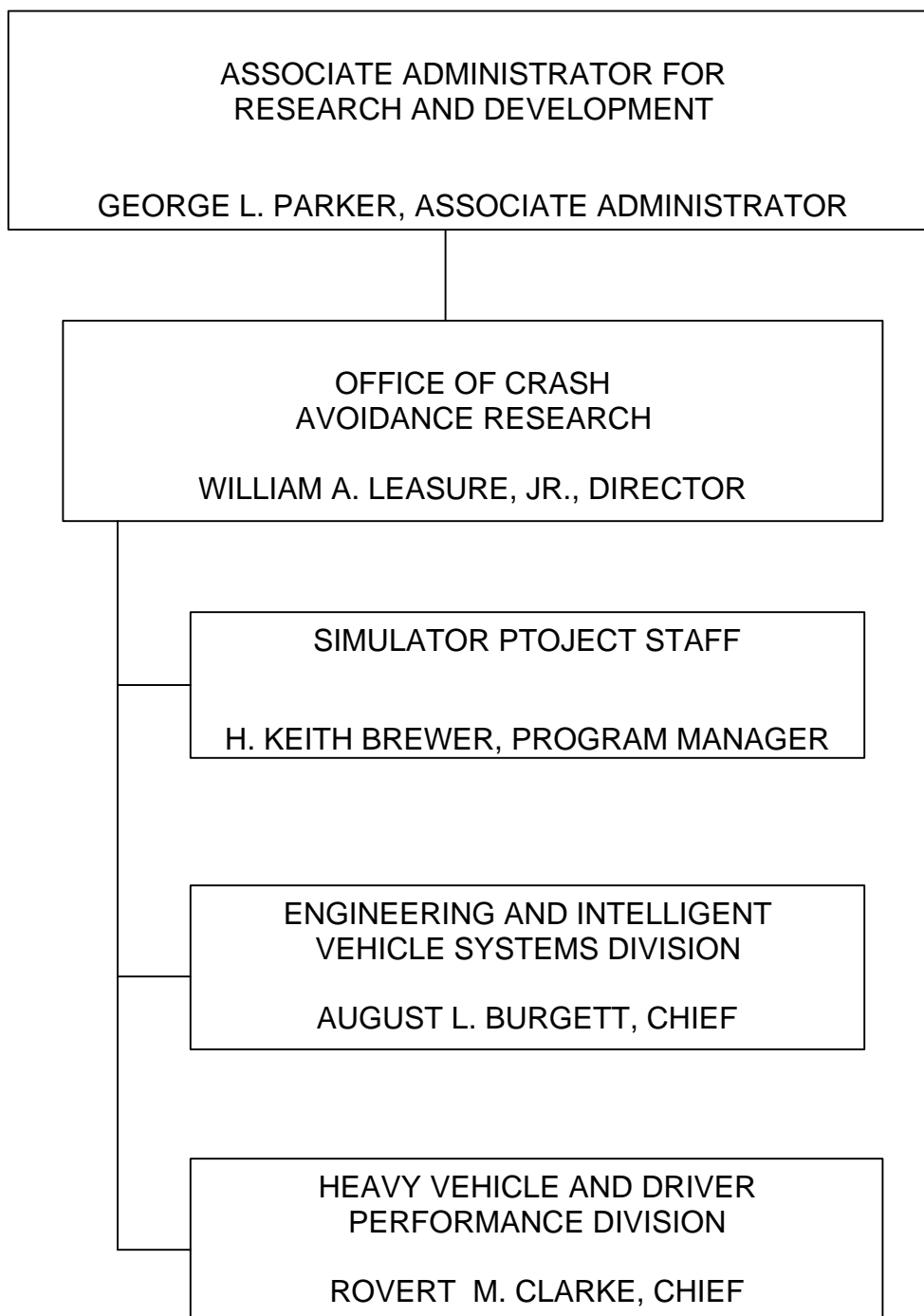
Engineering and Intelligent Vehicle Systems Division (NRD-52)

August L. Burgett, Chief
D. Denise Mills, Secretary
Jose L. Bascunana, Mechanical Engineer
Lloyd H. Emery, Highway Safety Research Engineer
Paul R. Spencer, Motor Vehicle Safety Research Engineer
Arthur A. Carter, Electronics Engineer
John J. Ference, Electronics Engineer

Heavy Vehicle and Driver Performance Division (NRD-53)

Robert M. Clarke, Chief
Deborah Woolard, Secretary
Michael Perel, Highway Safety Research Engineer
Michael J. Goodman, Engineering Research Psychologist
Ronald R. Knipling, Engineering Research Psychologist

National Highway Traffic Safety Administration



Staff Specialty Areas: Office of Crash Avoidance

William A. Leasure, Jr. — Director (202) 366-5662

Donna J. Stenski — Secretary (202) 366-5662

Research light Vehicle Dynamic and Simulation Division

August L. Burgett — Division Chief (202) 336-5672

Denise Mills — Division Secretary (202) 366-0388

Lloyd Emery — Research Engineer (202) 366-5673

- Focal point for initial contacts by public and private sector in the areas of braking, vehicle handling & stability, tire performance, trailer towing, vehicle inspection and aerodynamics
- General knowledge of NHTSA/DOT IVHS Program and Technical Activities
- COTR: Crash Avoidance Research Technology Support-Simulation Models
- COTR: IVHS Countermeasures for Run-Off-Road Crashes

Arthur A. Carter — Electronics Engineer (202) 366-5669

- COTR: Intelligent Vehicle Highway Systems Countermeasures for Rear-End Collisions Performance Specification Contract.
- COTR: Systems to Enhance Emergency Medical Service Response.
- NHTSA representative on the Federal Radionavigation Plan (FRP) Working Group.

Jose L. Bascufiana — Senior Research Engineer (202) 366-5674

- COTR: Interagency Agreement with the Air Force on “Development of Performance Specifications for Systems which assist in Avoiding Collisions during Lane change, Merging, and Backing.”
- COTR Indefinite quantity contract on “Crash Avoidance Research Technology Support in the areas of communications, Electronic Controls, and Computers for Automotive Traffic Safety.
- COTR Small Business Innovation Research contract, Phase II, on “Fiberoptic Vision System for Heavy Vehicle.”

Paul Spencer — General Engineer (202) 366-5668

- COTR: Vehicle Motion Environment characterization
- COTR: Intersection collision Avoidance Using IVHS countermeasures
- COTR: Hazard Assessment of IVHS Electromagnetic Radiation Emissions
- NHTSA representative on DOT IVHS Deployment Team

Jack Ference — Electronics Engineer (202) 366-0168

- Liaison to relevant external activities, including the Automated Highway System (BAA) and IVHS System Architecture development programs; NHTSA representative on DOT Architecture Team
- COTR: Technical support contract for collision avoidance sensor technology research and planned cooperative agreements with industry for deployment of collision avoidance systems
- COTR: Vision enhancement systems for driver improving visibility

Staff Specialty Areas: Office of Crash Avoidance Research

Heavy Vehicle and Driver Performance Research Division

Robert M. Clarke — Division Chief (202) 366-5662

Deborah Wollard — Division Secretary (202) 366-5662

Michael Perel — Research Engineer (202) 366-5675

- Responsible for human factors research related to vehicle headlighting, rear lighting & signalling, direct and indirect fields-of-view from vehicles, vehicle controls/displays, and driver/IVHS system interactions.
- Responsible for program and technical management of ongoing research projects on: Vehicle Headlighting System Performance Assessment; In-Vehicle IVHS Crash Avoidance Warning Systems — Human Factors Considerations; Development of Human Factors Measurement Protocols - Visibility From Vehicles; Visual Masking of Turn Signals; Development of Evaluation Protocols for Rear Lighting and Signalling Systems; Detectability of Signal Lamp Intensity Differences; Human Factors Systems Support

Michael Goodman — Engineering Research Psychologist . . . (202) 366-5677

- Responsible for IVHS human factors work related to driver behavior and driving performance measurement.
- Responsible for program and technical management of ongoing research projects on: Heavy Vehicle Conspicuity-Enhancing Marking Systems; Driver Divided Attention/Workload Assessment; Use of Vehicle-Based Feedback Cues to Enhance Driver Safety Performance; Development of a On-Board Vehicle, Portable Driving Performance Instrumentation and Data Acquisition System.

Ron Knipling — Engineering Research Psychologist (202) 366-4733

- Responsible for IVHS crash avoidance systems analyses, older driver/vehicle interaction issues, and human factors support/driving simulators.
- Responsible for program and technical management of ongoing research projects on: IVHS Crash Avoidance Problem Identification and Assessment of Potential Countermeasure Approaches; Older Driver Driving Performance Enhancement Using IVHS Technologies; Development of Real-Time, On-Board Driver Performance Monitoring Systems; Research Driving Simulator Visual Scene Scenario Development

Staff Specialty Areas: Office of Crash Avoidance Research

National Advanced Driving Simulator (NADS) Project Staff

H. Keith Brewer — Program Manager 366-5671

- Focal Point for all initial contacts by public and private sector concerning the NADS
- General knowledge on the technical requirements for the NADS and its subsystems
- Focal point for questions dealing with the NADS acquisition, schedule, and budget
- Focal point for issues dealing with the location of the NADS at the University of Iowa
- Chairman of NADS Technical Evaluation Team and member of the Source Evaluation Board (SEB)

John Machey — Senior Staff Engineer 366-5665

- Responsible for the monitoring and coordination of the NADS acquisition process
 - COTR on NADS technical and management support contracts
 - Source control for all technical and acquisition documentation
- Member of NADS Technical Evaluation Team

NHTSA Regional Offices

Region/States/Time	Region Address	Name/Title	Telephone
REGION I			
(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator Transportation System Center Kendall Square Code 903 Cambridge, MA 02142	George A. Luciano Regional Administrator	(617) 494-3427 FAX-617-494-3646
REGION II			
(New Jersey, New York, Puerto Rico and Virgin Islands) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator 222 Mamaroneck Avenue Room 204 White Plains, NY 10605	Thomas M. Louizou Regional Administrator	(914) 682-6162 FAX 914-682-7118
REGION III			
(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia) 8:00 a.m.-4:30 p.m.	NHTSA Regional Administrator BWI Commerce Park 7526 Connelley Drive, Suite L Hanover, MD 21076-1699	Frank D. Altobelli Regional Administrator	(410) 768-7111 FAX 410-768-7118
REGION IV			
(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator Suite 501 1720 Peachtree Road, N.W. Atlanta, GA 30309	Thomas J. Enright Regional Administrator	(404) 347-4537 FAX-404-347-0097
REGION V			
(Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) 8:00 a.m.-4:30 p.m.	NHTSA Regional Administrator 18209 Dixie Highway, Suite A Homewood, IL 60430	Donald J. McNamara Regional Administrator	(708) 206-3300 FAX 708-206-3312
REGION VI			
(Arkansas, Louisiana, New Mexico, Oklahoma, and Texas) 8:00 a.m.-4:30 p.m.	NHTSA Regional Administrator 819 Taylor Street, Room 8A3B Fort Worth, TX 76102-6177	Georgia S. Jupinko Regional Administrator	(817) 334-4300 FAX-817-334-8339
REGION VII			
(Iowa, Kansas, Missouri, and Nebraska) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator P.O. Box 412515 Kansas City, MO 64141	Norman B. McPherson Regional Administrator	(816) 926-7887 FAX-816-926-7884
REGION VIII			
(Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator 555 Zang Street, 4th floor Denver, CO 80228	Louis R. DeCarolis Regional Administrator	(303) 969-6917 FAX 303-969-6294
REGION IX			
(American Samoa, Arizona, California, Guam, Hawaii, and Nevada) 7:45 a.m.-4:15 p.m.	NHTSA Regional Administrator Suite 1000 211 Main Street San Francisco, CA 94105	Joseph Cindrich Regional Administrator	(415) 744-3089 FAX-415-744-2532

Region/States/Time	Region Address	Name/Title	Telephone
REGION X			
(Alaska, Idaho, Oregon, and Washington) 8:00 a.m.-4:30 p.m.	NHTSA Regional Administrator 3140 Jackson Federal Building 915 Second Avenue Seattle, WA 98174	Curtis A. Winston Regional Administrator	(206) 553-5934 FAX 206-553-0480

NHTSA Field Offices

Region/States/Time	Region Address	Name/Title	Telephone
OHIO East Liberty 7:45 a.m.-4:15 p.m.	Vehicle Research Test Center P.O. Box 37 East Liberty OH 43319	James Hofferberth	(513) 866-4511
TEXAS San Angelo	Uniform Tire Qualify Grading Test Facility P.O. Box 1671 San Angelo, TX 76902	Elvyn Galloway	(915) 655-0546

US DOT IVHS Contact list

list of DOT IVHS Contacts

Program Planning

- Gary Euler, FHWA, Program Management and Systems Engineering Division, 202-366-2201.
- Toni Wilbur, FHWA, Program Management and Systems Engineering Division, 202-366-2199

System Architecture

- Lee Simmons, FHWA, Program Management and Systems Engineering Division, 202-366-8048.
- Michael Schagrin, FHWA, Program Management and Systems Engineering Division, 202-366-2180. *Contact for System Architecture Consensus Building*
- George Beronio, FHWA, Program Management and Systems Engineering Division, 202-366-6111.

Institutional and legal Issues

- Cynthia Elliott, FHWA, Program Management and Systems Engineering Division, 202-366-8707.
- Beverly Russell, FHWA, Program Management and Systems Engineering Division, 202-366-2202.
- Julie Dingle, FHWA Office of Chief Counsel, General Law Branch, 202-366-1394.

Research and Development

- Michael Freitas, FHWA, IVHS Research Division, 703-285-2421.
Contact for Commercial Vehicle and Rural Systems Research
- Frank Mammano, FHWA, IVHS Research Division, 703-285-2405.
Contact for Traveler Information Systems Research
- Alberto Santiago, FHWA, IVHS Research Division, 703-285-2092.
Contact for Traffic Management Systems Research
- Ronald Boenau, FTA, Office of Training, Research, and Rural Transportation, 202-366-0195. *Contact for Transit Research*
- Ronald Fisher, FTA, Office of Training, Research, and Rural Transportation, 202-366-4995. *Contact for Transit Research*
- August Burgett, NHTSA, Office of Crash Avoidance, 202-366-5662.
Contact for Safety Research

Operational Tests

- George Schoene, FHWA, Operational Tests Division, 202-366-2197.
- Michael Halladay, FHWA, Operational Tests Division, 202-366-6503.
- Robert Rupert, FHWA, Operational Tests Division, 202-366-2194.
- Ronald Boenau, FTA, Office of Training, Research, and Rural Transportation, 202-366-0195. *Contract for Transit Operational Tests*
- Ronald Fisher, FTA, Office of Training, Research, and Rural Transportation, 202-366-4995. *Contact for Transit Operational Tests*
- August Burgett, NHTSA, Office of Crash Avoidance, 202-366-5662. *Contact for Safety Operational Tests*
- Steve Clinger, FHWA, Operational Tests Division, 202-366-2160. *Contact for Rural and Safety Operational Tests*
- Denise Bednar, FHWA, Operational Tests Division, 202-366-6143. *Contact for Commercial Vehicle Operational Tests*
- Douglas McKelvey, FHWA, Motor Carrier Analysis Division, 202-366-1861. *Contact for Commercial Vehicle Operational Tests*

Early Deployment

- Larry Dames, Traffic Management Systems Division, 202-366-2300.
- Shelley Lynch, Traffic Management Systems Division, 202-366-2184.

PART THREE

State IVHS Organizations

Arizona Department of Transportation

206 South 17th Avenue
Phoenix, Arizona 85007

A Summary of Arizona Department of Transportation's Research & Development Program

ADOT is engaged in a number of IVHS research and development efforts through projects being carried out within the state and in collaboration with other states, in the following areas: Commercial Vehicle Operations, Freeway Management Systems, Rural Traveler Information Systems, Human Factors in IVHS, and Real-Time Traffic Control Strategies. We are in the process of forming an IVHS AMERICA Arizona Chapter. The first exploratory meeting with the key transportation agencies in the state is scheduled to be held on March 30, 1994.

The IVHS R&D efforts launched by ADOT seek to place a special emphasis on applications that address transportation needs in rural Arizona. Rural Advanced Traveler Information System on I-40 in northern Arizona is such a project. Arizona is actively collaborating with other states in IVHS research through the ENTERPRISE project. Arizona was actively involved in the HELP/Crescent project and is planning to participate in the HELP, Inc. project. RHODES-ITMS is an IVHS project investigating real-time traffic control at interchange locations with an anticipated operational test on the heavily traveled Interstate 17 corridor in the metropolitan Phoenix area.

Organizational Chart

The only IVHS activity in Arizona Department of Transportation that is clearly identified at the present time is ADOT's IVHS R&D program carried out through the Arizona Transportation Research Center. This program is administered by Dr. Sarath Joshua. See attached page for a full description of ADOT's IVHS R&D program.

Other IVHS related implementation or planning activities being carried out by ADOT are:

Implementation

Phoenix Freeway Management System
Phoenix ADOT Maintenance District
Project Engineer: Jim Shea
(602) 255-6588
(602) 495-9013 (Fax)

Planning

Tucson Freeway Management Study
Pima Association of Governments
Director, Jim Altenstadter
Tucson Area IVHS Early Deployment Study — same as above

Key IVHS Contacts in Arizona Department of Transportation

- Larry Bonine, Director ADOT, Ph: (602) 255-7226; Fax (602) 255-6941
- Tom Warne, Deputy Director, Ph: (602) 255-7550; Fax (602) 255-6941
- Gary Robinson, State Highway Engineer, Ph: (602) 255-7391; Fax: (602) 255-8315
- Chuck Eaton, Assistant State Engineer, Ph: (602) 255-7766; Fax: (602) 407-3047
- Harry Reed, Director Transportation Planning Division, Ph: (602) 255-7431; Fax: (602) 256-7659
- Jay Klagge, Deputy Director, Transportation Planning Division, Ph: (602) 255-4112; Fax: (602) 256-7659
- Dan Powell, District Engineer, Ph: (602) 255-7190; Fax: (602) 255-6983
- Jim Altenstadter, Director, PAGTPD, Ph: (602) 628-5313; Fax: (602) 628-5315
- Larry Scofield, Manager, Arizona Transportation Research Cntr., Ph: (602) 831-1353; Fax: (602) 831-5677
- Sarath Joshua, IVHS R&D Program Administrator, Arizona Transportation Research Center, Ph: (602) 831-5258, Fax: (602) 831-5677
- Mary Silva, Librarian, ATRC, Ph: (602) 831-0624; Fax: (602) 831-5677

California Department of Transportation (Caltrans)

CALTRANS
1120 N Street
Sacramento, CA 95814

New Technology Overview

The California Department of Transportation (Caltrans) has historically met transportation challenges by expanding its transportation infrastructure with both new and expanded highways. This strategy has worked satisfactorily until three new factors were introduced into the new highway construction equation. These factors are:

- 1) Increased cost of construction and reduced highway construction funding,
- 2) diminishing air quality in part caused by automobile traffic, and
- 3) stringent environmental requirements for new construction.

These constraints require that California's transportation strategy change from growing bigger to meeting future transportation challenges by working smarter in order to become more efficient. This need coupled with the rapidly expanding field of advanced transportation technologies promises to allow Caltrans to meet California's transportation challenges of the future. Additionally, the advances offered by new technology provide not only smarter alternatives but less expensive ones as well.

Development Program

The Caltrans New Technology Development Program Budget for Fiscal Year 1993-94 totals approximately \$30 million.

These resources will be used to continue a program which was established to research, develop and apply advanced transportation technologies in a manner which benefits all transportation modes. These benefits will contribute to the development and improvement of a balanced multimodal transportation system.

Application of these technologies can improve the safety, productivity and energy efficiency of all transportation modes, including transit systems and commercial vehicles; reduce traffic congestion; improve intermodal connections between various types of travel; and when combined with alternative fuel technologies currently under development, substantially reduce the air pollution caused by fossil fuels.

The Caltrans New Technology Development Program will continue to closely examine the advancements in computer processing, communications, vision systems, sensors, artificial intelligence and propulsion systems to determine how they can benefit California's transportation system. These technologies can be directly applied to both urban and rural settings. In addition, technology advancements in air transport will continue to be examined. The Caltrans New Technology Program provides many opportunities for defense

and aerospace industries to become partners in the research, development, and deployment of new transportation technology systems.

The New Technology Development Program addresses both transportation infrastructure and vehicles. Infrastructure includes highways, guideways, rail systems and support hardware, and facilities. Vehicles include automobiles, high occupancy vehicles (including car pools, van pools, and buses) trains and commercial vehicles.

Key Programs

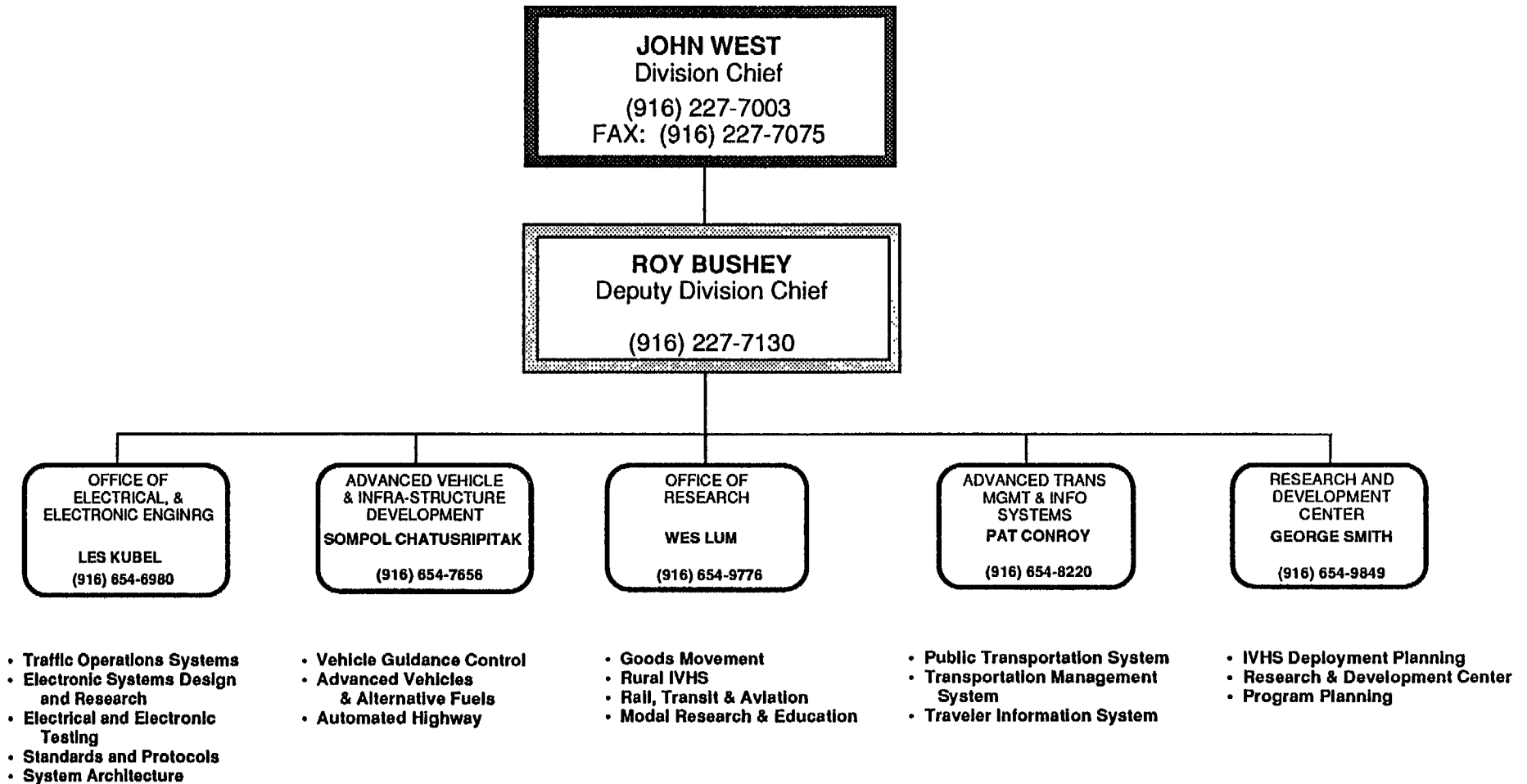
The New Technology Program is divided into three key program areas each having program subcomponents. These include:

- 1) Advanced Transportation Systems
 - Advanced Traffic Management
 - Real-Time Highway Information to the Traveling Public
 - Advanced Public Transportation
 - Advanced Vehicles/Highway Control Systems
 - Field Operational Tests
 - Early Development Planning
 - Rural Applications
 - Goods Movement
 - Air, Rail, Shipping (Ports)
- 2) Alternative Fuels Program
 - Electric Vehicles
 - Fuel Cell Research
 - Other Alternative Fuels
- 3) Worker Safety
 - Roadway Maintenance
 - Roadside Maintenance
 - Structure Maintenance
 - Construction Robotics

Note: If you would like to be on our mailing list, please send a postcard with your name and address to:

Division of New Technology, Materials & Research
Attention: New Technology Program
1227 "0" Street, 5th Floor
Sacramento, CA 95814

CALTRANS NEW TECHNOLOGY DEVELOPMENT PROGRAM



March 1994

Colorado Department of Transportation

1325 S. Colorado Blvd.
Denver CO 80222

How the Colorado Department of Transportation is Organized for IVHS Applications

The Colorado Department of Transportation (CDOT) IVHS/New Technologies Group is responsible for implementing a strategic plan for the research, development, demonstration and deployment of IVHS technologies in Colorado. This paper summarizes organization and the primary contacts for the various IVHS programs.

CDOT's vision for the implementation of IVHS technologies is summarized in The C-Star Program. CDOT also publishes a number of documents and information articles in support of its IVHS research, development and implementation activities.

- **Item #201: C-Star Strategic Plan, by CDOT and Castle Rock Consultants,** (214 pages). Outlines a program of IVHS activities to address the needs of the state's highway system into the next century. \$10.00 post paid.
- **Item #202: Denver Metro Area Early Action Plan** (23 pages). An outline of the recommended start-up projects for the development and deployment of IVHS in the Denver Metro Area. October 1992. \$4.00
- **Item #203: Denver Metro Area Strategic Plan** (53 pages). This report provides the framework for the identification and implementation of the most promising and potentially most effective IVHS technologies in the Denver metro area. October 1992. \$4.00

Contact Terry Barela Huddleston, CDOT's IVHS Staff liaison at (303) 757-9454 for a complete list of available publications.

For historical reasons, CDOT organization is somewhat decentralized with the majority of construction and operations budgeting authority assigned to the transportation regions. Most IVHS functions and responsibilities are shared between the central offices and the offices of six transportation regions. An abbreviated CDOT organization chart, Figure 1, shows the relationship between the major IVHS implementation groups. The responsibility for planning and coordinating the program lies with the IVHS/New Technologies Group in the Division of Transportation Development.

Within CDOT, an informal IVHS team structure has been formed to facilitate early development of the IVHS program, better integrate the functions of the department, and bring in outside participants. The membership of this organization is not constant and varies depending upon the issues being promoted. CDOT's IVHS organization was only recently implemented and is still evolving.

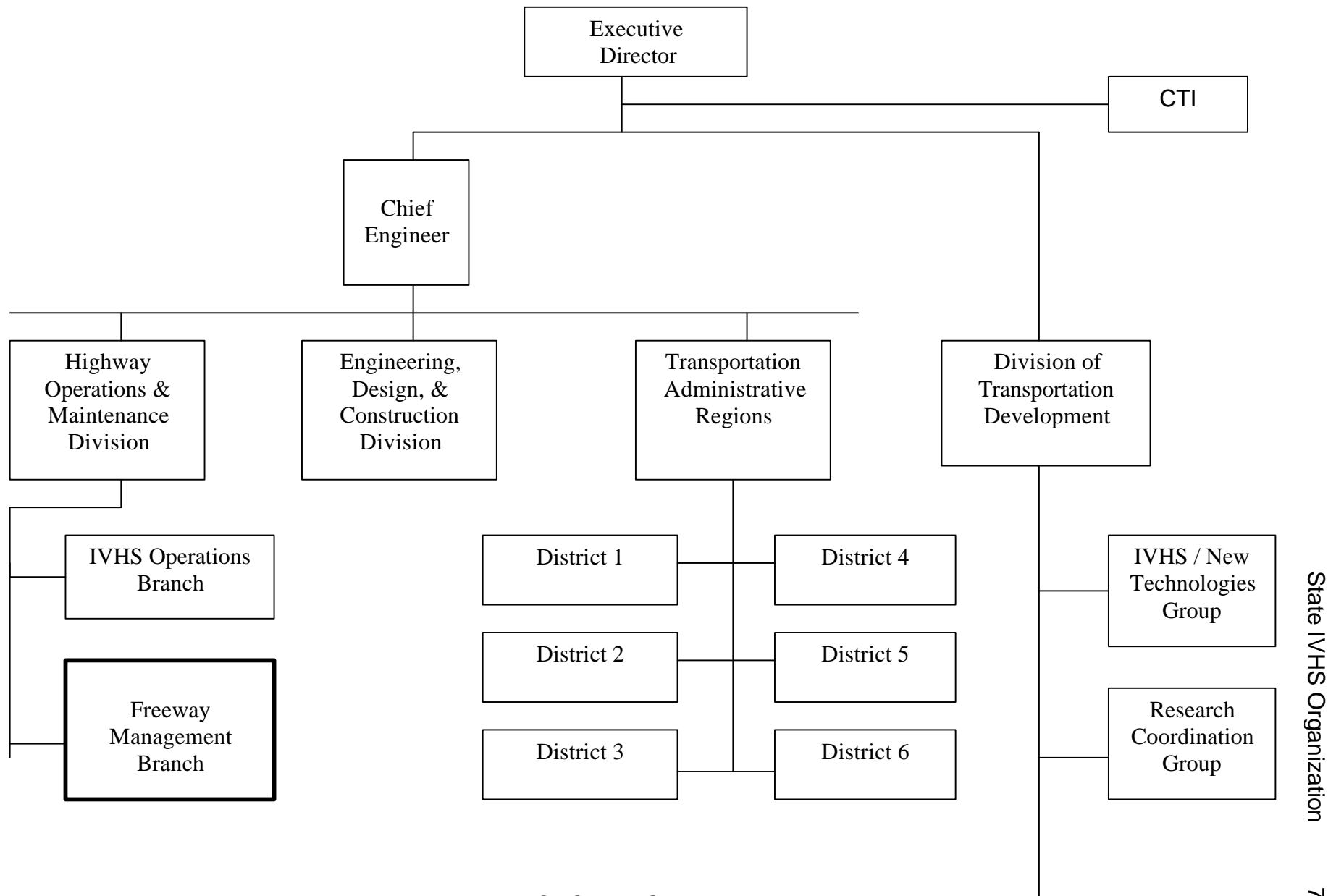


Figure 1 Proposed CDOT IVHS organizational structure

IVHS/New Technologies Group

This group is responsible for overall IVHS planning and coordination and the IVHS elements of the state research program. The principal contact is:

John P. Kiljan

IVHS Program Manager

(303) 757-9608

(303) 757-9974 (fax)

IVHS Operations Branch

This organization's responsibilities are for multi-region IVHS operations and coordinating regional programs. The principal contact is:

Larry Corcoran

State IVHS Operations Engineer

(303) 757-5159

(303) 757-1026 (fax)

Commercial Vehicle Operations Group

Responsibilities for this group focus on improving the efficiency and safety of commercial vehicles including model ports of entry, institutional issues, AVI and WIM technology. The principal contact is:

Greg Fulton

CVO Program Manager

(303) 757-9813

(303) 757-9727 (fax)

The ENTERPRISE Group

Colorado is one of 11 state members of the Enterprise group. Enterprise is a consortium of cooperative research, development and implementation of IVHS technologies. Colorado administers the contracts for this organization. The principal contact is:

Neil Lacey

ENTERPRISE Program Administrator

(303) 757-9823

(303) 757-9974 (fax)

Business Development-Public-Private Partnerships

This new office is responsible for establishing business development and private-sector participation to secure private funding for IVHS operations. The principal contact is:

Deborah K. Daniell

Business Development Specialist

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legal Issues Group

Responsibilities for this group focus on the ability to resolve institutional as well as legislative issues related to IVHS and the potential for public-private partnerships. The principal contact is:

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Assistant Attorney General
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(303) 866-3558

Transportation Region 1

This region covers an area from the Kansas border to Vail Pass on I-70. The principal contact is:

Matt Reay
Region 1 Traffic Engineer
(303) 757-9122
(303) 3661314 (fax)

Transportation Region 3

This region continues from the town of Vail through Grand Junction to the Utah border. The principal contact is:

Rich Perske
Region 3 Preconstruction Engineer
(303) 248-7212
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Transportation Region 6

This region covers the Denver Metro Area. The principal contact is:

Lou Lipp
Region 6 Traffic and Safety Engineer
(303) 757-9511
(303) 757-9907 (fax)

Contracting with CDOT is governed by the procurement rules of the State of Colorado. Engineering contracts are handled differently than non-engineering contracts. In general, contracts which require production engineering plans and specifications must be bid from a pre-approved list of contractors. Registration within the State of Colorado is required for pre-qualification. Contracts for planning, systems, development, and supplying equipment generally do not require pre-qualification and are often advertised through publications such as the Commerce Business Daily or through the information services of IVHS America. For more information contact:

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(303) 757-9669 (fax)

Florida Department of Transportation

Traffic Engineering Office
605 Suwannee Street, M.S. 36
Tallahassee, Florida 32399-0450

IVHS Contracting Information for IVHS America

The Florida Department of Transportation does not have an IVHS office. The Traffic Engineering Office is the technical contact for IVHS activities in the Department. Contact person is:

Jack A. Brown, P.E.

State Traffic Operations Engineer
Telephone number: (904) 488-4284
Fax number: (904) 922-7292

The Department does not have a separate category for IVHS Projects. Please refer to the attached policy statement on IVHS concepts and technologies for application into major transportation projects.

The Florida Department of Transportation (FDOT) recognizes the potential benefits of IVHS concepts and technologies in enhancing the efficiency, mobility and safety of Florida's Transportation Systems. The FDOT will analyze IVHS concepts and technologies for potential application when developing major transportation projects, and will implement when found to be cost effective and the availability of funds will accommodate. IVHS applications will be standardized and compatible statewide.

A State of the Art for Intelligent Vehicle-Highway Systems in Florida (Executive Summary)

When President George Bush announced his administration's new National Transportation Policy in March of 1990, it included a strong commitment to "develop innovative transportation technology" to make the United States competitive in the global market place. This applies to both the provision of a world class transportation system for all Americans and her visitors, as well as marketable technologies that can be offered abroad.

In the landmark Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, this goal was seconded by Congress' commitment of \$155.3 billion over the next six years for the intermodal surface transportation system. This included \$659 million for research, development and testing (RD&T) in the emerging technologies referred to as "Intelligent Vehicle-Highway Systems, or IVHS." Additionally, the 1991 Appropriations Bill provided \$140 million for IVHS. Thus in fiscal year 1992 a total of \$234 million are dedicated to IVHS.

This assures that within a decade electronically linked vehicles and control centers will team to provide quicker, safer, more efficient and more cost effective transportation over our nations streets and highways, without significant further diversion of scarce-and expensive-property.

This trend toward “smart cars” and “smart highways” is irreversible. As certain as computers were destined to affect our every day lives, so too will these technologies help us in moving about.

Recognizing this, the Florida Department of Transportation (DOT) undertook a study to assess the state-of-the-art as it was at the beginning of the last decade of the 20th century, so this state-always an innovator-could be poised to enter the 21st century as a leader.

The report is that state-of-the-art and practice. It identifies what IVHS is and is not. It explains the key categories of IVHS.

The report further details the more specific subsystem components (or elements) of IVHS in the context of their functional application, such as surveillance, control, communications, and so forth.

Many of the technologies are, indeed, neither futuristic nor pipe dreams. The technologies exist today. What has been lacking is a concentrated, coordinated program of research, development and technology applications. This is now being overcome at all levels with increased proactive RD&T in IVHS. Early “operational tests” are already in planning, design, development and some are even operational. These projects within Florida, from throughout the U.S.A. and even abroad best dramatize what is truly state-of-the-art.

A number of IVHS projects are in operation or in planning for Florida. These are presently:

- the Travel Technology (TravTek) project in Orlando;
- the Rural Evaluation of Advanced Concept Highways for I-75 (REACH-75) project in north-central Florida and Georgia;
- Advanced Traveller Information Systems in Jacksonville;
- Electronic Toll & Traffic Management on the Florida Turnpike;
- Advanced Public Transportation Systems in Tampa Bay and the Southeast Florida Corridor (referred to as the Integrated Corridor System, or ICS);
- I-4 Incident Management;
- Advanced Public Transportation Systems in Metro-Dade County; and
- Applications to Commercial Vehicle Operations via Advantage I-75.

Florida is in a good position to be a leader in IVHS research, development, testing and deployment, but this will not come naturally, it will take a concerted and proactive effort on the part of the Florida DOT, local agencies, universities, private-sector manufacturers and consultants, and the travelling public. Only a strong partnership among these parties can propel Florida forward in this exciting industry.

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Summary/Overview of IVHS Program

ADVANCE

ADVANCE (Advanced Driver and Vehicle Advisory Navigation Concept) is the largest field operational test using the concept of dynamic route guidance and one of the largest Advanced Traveler Information System (ATIS) projects in the world. The Project is a joint public-private partnership that includes the Illinois Department of Transportation (IDOT), the Federal Highway Administration (FHWA) Motorola, Inc., and the Illinois Universities Transportation Research Consortium (IUTRC). These four organizations are considered the founding Parties and are being joined by the American Automobile Association on the ADVANCE Steering Committee. Twenty-two other participants are also providing required services and equipment.

The ADVANCE operational test is being implemented in a 310 square mile area of the northwestern Chicago suburbs. The test area includes O'Hare Airport and a wide range of land uses from low density development to high density office and commercial centers. Approximately 750,000 people live in the area.

ADVANCE will include the installation of on-board computer equipment in at least 3,000 vehicles. This system will provide drivers with up-to-date traffic information to avoid incidents and congestion and to reduce travel times. It is anticipated that approximately 15 percent of the vehicles to be equipped will be commercial vehicles.

The ADVANCE Project budget is approximately \$52 million with the funding being split 68 percent federal, 20 Percent state and 12 percent private sector.

Gary-Chicago-Milwaukee Priority Corridor Initiative

Illinois is involved in a cooperative multi-state application of IVHS technologies with Wisconsin and Indiana as part of the Gary-Chicago-Milwaukee (GCM) Priority Corridor initiative. In March 1993, the United States Department of Transportation designated this corridor as one of four IVHS Priority Corridors in the United States that met all the required transportation and environmental criteria set forth in Title VI, Part B of the Intermodal Surface Transportation Efficiency Act of 1991.

Automated Vehicle Identification (AVI) Project

IDOT will conduct a test of an Automated Vehicle Identification (AVI) traffic management system using information generated by the Illinois State Toll Highway Authority's AVI/Electronic Toll Collection system that is being im-

plemented along Interstate 355. The effort will develop and test software for obtaining travel time information.

Illinois CVO Institutional Issues Study

The IVHS CVO Institutional Issues Study being performed by the University of Illinois at Urbana-Champaign for IDOT is nearing completion. A draft final report has been prepared that identifies the institutional issues which could serve as impediments to the effective utilization of IVHS technologies and concepts for CVO and the CVO areas that potentially could be improved with use of IVHS technologies. Purdue University is performing a parallel study for the Indiana Department of Transportation.

IDOT is also participating in an interstate institutional issues study that is being conducted by the Iowa Transportation Center. This study will seek to identify and find solutions to the issues that act as barriers to multi-state development, procurement and operations of IVHS/CVO systems in Iowa and the six states (including Illinois) that surround Iowa.

Current Status of IVHS Projects

ADVANCE

The ADVANCE Project is the major IVHS effort being undertaken in northeastern Illinois. It is a operational test of dynamic route guidance being done in consort with the Federal Highway Administration Illinois Department of Transportation (IDOT), Illinois Universities Transportation Research Consortium, Motorola Inc, American Automobile Association, and twenty-two other private sector participants. ADVANCE builds on the significant infrastructure of traffic management facilities that IDOT put in place beginning in the early 1960's.

The ADVANCE Project is proceeding into the latter stages of the Development Phase which began in late 1991. It is expected that this Phase will be completed in the fall of 1994 at which time the Deployment Phase of the Project will begin. The Deployment Phase will provide in-vehicle navigation to more than 3,000 vehicles. These vehicles will also be used as probes to update the status of the network in a 310 square mile area.

The autonomous version (the stand alone system) of the Mobile Navigation Assistant (MNA) has successfully passed the Verification and Validation (V&V) testing. It provides significant improvements in route planning times, forewarning of turning movements and positioning of the vehicle on the display map over previous versions. The Project test fleet has now been equipped with memory cards and V&V testing was recently completed for this product enhancement.

All computer equipment has been installed in the ADVANCE Traffic Information Center (TIC) located at the ADVANCE Project office and communications interfaces have been made with several external entities such as IDOT's Traffic Systems Center.

The RF Communications system is under rapid development to provide the necessary two-way radio data communications between the TIC and the

MNA's in the vehicles. A high-speed new digital communications technology using standardized hardware and will be used in the Deployment Phase of ADVANCE.

Currently, design efforts are being directed towards the development of the first integrated system (Release 1). This system will represent the first occasion that real-time traffic information is transmitted in both directions between the equipped vehicles and the TIC. System integration and testing is scheduled to be completed in April 1994.

Further enhancements and testing will follow in the late Spring of 1994 (Release 1.5) to develop an ADVANCE product that will be available for installation in a small number of participant vehicles in the last quarter of 1994. The number of equipped vehicles will remain constant for approximately three months to review system performance. After this shake out period, an accelerated installation ramp up schedule will be implemented to achieve complete deployment of the ADVANCE fleet within 24 months. Another eighteen months will then follow for continued operation and evaluation of the ADVANCE system.

Gary-Chicago-Milwaukee Priority Corridor Initiative

The states of Indiana, Illinois and Wisconsin have formalized an agreement to cooperatively plan and develop IVHS technologies for the GCM Priority Corridor initiative. An Agreement signed in August 1993 (Memorandum of Understanding) set forth a framework to begin the development of a Corridor Program Plan (CPP). The Memorandum of Understanding included the creation of the GCM Executive and Technical Committees that will organize and administer the GCM Priority Corridor initiative and other basic provisions.

The three states executed an Agreement in February 1994 to establish the joint effort for creation of the CPP. The Agreement outlines the responsibilities and cost sharing provisions among the states to perform the CPP.

In December 1993, a Request for Proposal (RFP) was sent to prospective consultants to conduct the CPP. Eleven firms responded and three firms have been invited to the final selection phase. It is expected that a contract will be signed to perform the CPP in April 1994.

IDOT has proposed a project entitled "Transportation Information Expansion and Unification Program" (TIE UP) as part of the funding specific to Illinois under the GCM Priority Corridor initiative. The major components of TIE UP include the development of a base package of transportation information which can be used by cable television in a format compatible with existing cable technology, development of area-specific information packages for use in specific test areas in the GCM Corridor, and installation of interactive display terminals providing real-time travel information at a variety of locations throughout the Corridor.

AVI Project

Contract negotiations are in the final stage to conduct this test of an AVI traffic management system using information generated by the Illinois State

Toll Highway Authority's AVI/Electronic Toll Collection system along Interstate 355. Execution of this agreement is expected in April 1994.

Illinois CVO Institutional Issues Study

A draft final report has been issued by the University of Illinois at Urbana-Champaign for this study. The bi-state (Illinois and Indiana) Steering Committee will be meeting in the early spring to discuss this draft report and the draft report that Purdue University is preparing for the Indiana Department of Transportation. Final reports are expected to be published by both universities before June 30, 1994.

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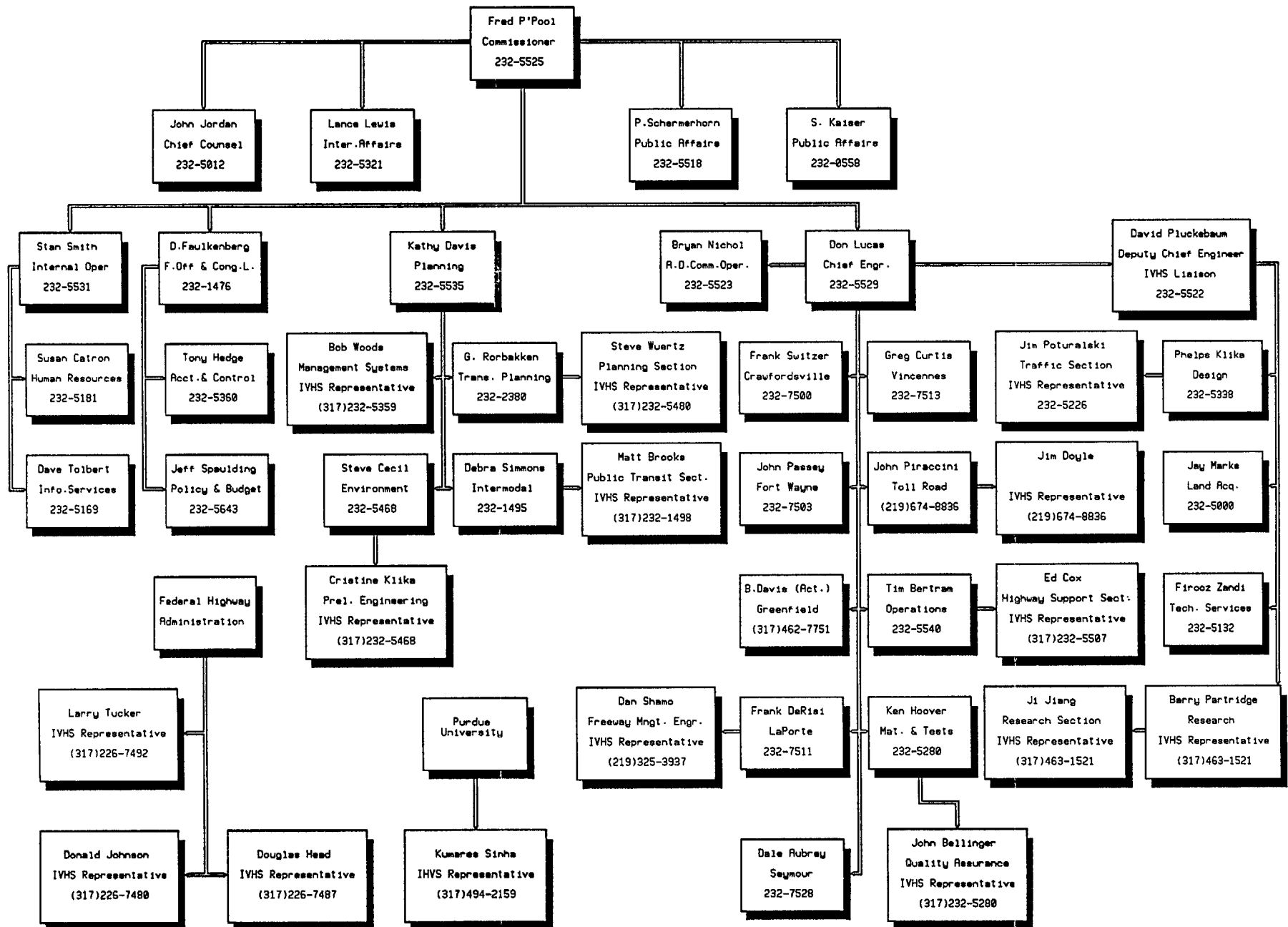
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Indiana DOT Organizational Chart and IVHS Representatives



Kentucky Transportation Cabinet

State Office Building
501 High Street
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Our current IVHS program consists of three projects. The ADVANTAGE I-75 project is to facilitate the movement of trucks on I-75 in the United States and Route 401 in Canada. All contracts have been let and equipment installation is underway. The total cost is estimated to be \$10,800,000.

Final design has just begun on an ATMS/ATIS project for the Cincinnati, Ohio-Northern Kentucky area. A fact sheet prepared for a press briefing on February 15, 1994 is attached. Construction contracts are expected to be let in calendar year 1995.

A Freeway Incident Management Program is being planned for I-65 in Louisville and extending into Indiana. A schedule is not available at this time. This ATMS/ATIS project is expected to cost \$10,000,000-13,000,000.

We have not developed a Strategic Plan for IVHS or budgeted IVHS projects separately.

We do not have any RFPs or solicitations at this time. We will have procurements available in calendar year 1995.

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Maryland Department of Transportation

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IVHS Progress In Maryland

The Maryland State Highway Administration (MSHA) is currently directing a multitude of endeavors in the IVHS (Intelligent Vehicle Highway Systems) arena, under the structure of our own acronym, called **CHART (Chesapeake Highway Advisories Routing Traffic)**. The CHART program represents an extended commitment to IVHS, covering traffic management and motorist information systems, coordination and cooperation with other transportation agencies at the Federal, State and Local level, and demonstrating a balance between immediate needs and future research & development. Partners in our CHART efforts include the Maryland State Police (MSP'), the Maryland Transportation Authority (MdTA), the Mass Transit Administration (MTA), the FHWA county governments, academia, and private industry. The following highlights our CHART program:

- **History:** Maryland's CHART program was born four years ago, an evolution from early efforts aimed at assisting travelers trying to "reach-the-beach," Ocean City's summer beach haven. These efforts included fast-response incident management, motorist information, and roving patrols. Our early focus has been on Incident Management, and our efforts in this arena are reflected in the many success stories over the past three years; we have concentrated on developing solid institutional arrangements with our partners and learning techniques and examples from other agencies across the country.
- **Current Coverage:** **400** miles of freeways and 400 miles of major arterials in Maryland's eight critical traffic corridors. This includes 44 signal systems (over 400 individual signals) currently online (via real-time link with computers) or under construction, covering approximately 200 miles of arterials.
- **Institutional Elements:** (a) established an MSP Liaison Officer assigned full time to the MSHA to improve communications, coordination and cooperation; (b) interagency agreement between MSHA and MSP to coordinate highway operations, providing the least disruption to the motorist; (c) MSHA Maintenance Policy — to use whatever equipment necessary to re-open roadways, recognizing that public safety is the highest priority; (d) regular meetings of our Steering Committee with membership from Federal, State, and local governments, academia, and private industry and regular meetings of working groups, made up of key technical and institutional personnel; and (e) regular contact with all major commercial media, providing traffic conditions and information for broadcast.

- **Current Traffic Management & Motorist Information Tools:** Travelers Advisory Radio (TAR), with coverage of key congestion and major event areas through 25 permanent transmitters; Variable Message Signs (VMS), with 30 permanent and several portable signs located in key areas and major service-to-service interchanges; Emergency Traffic Patrols, which patrol the major areas assisting motorists with breakdowns and incidents; Emergency Response Units, vans equipped with small arrow-boards and necessary incident management tools, charged with setting-up traffic control at incident scenes and working with any other agencies present to re-open roadways; Freeway Incident Traffic Management routes, preplanned detour routes for all major highways in Maryland.
- **Operations:** Systems operations are controlled locally by a Traffic Operation Center (TOC). MSHA & MSP currently operate 3 TOC's, the MdTA operates 1 TOC, and Montgomery County operates 1 TOC. When the local TOC's are not on line, systems operations are controlled by the Statewide Operations Center (SOC). The SOC, now operating out of the MSHA central office in Baltimore, is scheduled to begin operations in late 1994 at a new building now under construction next to the MSHA's Office of Traffic & Safety near BWI Airport. This new center will be manned 24 hrs/day by State Highway and State Police personnel.
- **The Future:** Our future success is directly related to our commitment to both the institutional and technical issues. We are currently developing a multi-year strategic plan, which will include feasibility studies for the implementation of surveillance & detection technology, time schedules for the implementation of motorist information technology, available public and private funding sources, and necessary research & development. Our personnel are very active at all levels: national participation in IVHS-related workshops & seminars, including ITE, TRB, and IVHS America; regional participation in the I-95 Corridor Coalition, including the holding of 3 key leadership positions in the Coalition; State participation in IVHS-related activities, including multi-modal/multi-agency submissions of Operational Test Proposals.
- **Future Traffic Management & Motorist Information Tools:** Completing statewide TAR coverage, using current monopole technology, leaky-cable, and looking to future developments in this technology; completing statewide coverage of VMS with 12 new permanent signs to be operational within the next year; statewide surveillance coverage with 21 CCTV cameras to be operational by early Fall, utilizing current CCTV technology and complete digital transmission; statewide detection coverage, including real-time interaction with current loop-detection systems, the deployment of 114 overhead detectors to be operational by early Fall, and the interface with the Cellular Phone Operational Test project being developed jointly with VDOT, Engineering Research & Associates, Farradyne, and Bell Atlantic.

- **Future Integration:** Construction is nearing completion on the new SOC a state-of-the-art 7 million dollar facility, to be located near the Baltimore-Washington Airport, adjacent to SHA's Office of Traffic and Safety. The MSP are currently integrated into the CHART operations plan, as will be the Office of Maintenance at MSHA. The building is currently scheduled to include enhancements of our operating systems, which will include software capable of handling all VMS, TAR, signals, detection, and video surveillance technology from any given single terminal, with a user-friendly interface. Software development is under the direction of JHK & Associates, who developed the Smart Corridor traffic management software for the Los Angeles Smart Corridor program. By the following Winter season, the SOC is also scheduled to include full winter-storm mapping and all maintenance requirements, full emergency operations center capabilities, and capability to monitor all MSHA and MSP radio systems. Long term IVHS/CHART initiatives are also being considered in it's design (utilizing open architecture and standard protocols), in addition to features making it a stand-alone building. The SOC is expected to begin operations in late 1994, and be fully operational in late 1995.
- **Advanced Systems Development:** Maryland is involved in several unique operational tests in the IVHS arena, which are supported by the FHWA: the MSHA is a partner with Montgomery County DOT in a project demonstrating live video transmission from the county's airplane, which will provide feeds to TOC's in the relevant areas, and to mobile incident management vehicles operated by the county; The MSHA is a partner with Virginia in a FHWA Demonstration Project involving TAR, VMS, and Autoscope video image detection systems; interface with the Cellular Phone Operational Test mentioned previously; and the MSHA is also involved with National Systems Architecture Program, a partner on the Westinghouse team who recently was awarded one of five Systems Architecture study grants.

For further information regarding the Maryland State Highway Administration's IVHS activities, contact Mr. Steve Kuciemba at (410) 787-5884. For further information regarding the MSHA's Incident Management activities, contact Mr. Lee McMichael at (410) 787-5804.

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IVHS Programs and Projects, January 4, 1994 — Foreword

This is a brief outline of the different projects and programs related to IVHS (Intelligent Vehicle Highway Systems) currently under various stages of planning, development or implementation by the Michigan Department of Transportation (MDOT). Several of these programs are funded in part by the Federal Highway Administration, MDOT, private industry partners such as General Motors, Ford, Chrysler, GE/Ericsson, Automobile Association of America, Michigan Bell Telephone, Whelen Engineering and Pat-Tel.

The University of Michigan, Michigan State University and Wayne State University are under contract with MDOT on several IVHS projects.

The information provided in this document is a periodic update on the status of various programs and projects. Additional information on any of these programs and projects can be obtained by contacting Dr. Kunwar Rajendra at (517) 373-2247 or (313) 256-9800.

Transportation Systems: Projects and Programs

1. IVHS Program / Operational Field Tests

A. DIRECT (Driver Information Radio using Experimental Communication Technologies):

Phase I: System Design has been completed. The Phase II: System Implementation Plan has been approved by the Executive Committee and the work has already begun as of December 1, 1993.

The primary goal of the Project is to evaluate the user benefits, institutional issues and technical issues of en-route driver advisory and traveler information services in an operational setting. The emphasis will be on the testing and evaluation of voice-based communication systems that can offer: a) basic services at a minimal incremental cost to the traveler; and b) a high potential for operational deployment. The Project will deploy, operate and evaluate a selected group of communication technologies that satisfy these criteria. In addition, the Project will provide digital data, such as the latitude/longitude of incident locations and differential GPS, for assessment by the Partners' of enhanced services like route guidance and navigation applications.

This revised plan, while utilizing elements of the work performed in Phase I, emphasizes simplicity, low cost, very limited expansion of the infrastructure and an increased role of the public-private partnership already in progress. This partnership will allow the introduction of evolving communications technologies, such as the 220 MHz band; development of the MTC as a metro-wide traffic information center; and

the utilization of the MTC and Metropolitan Detroit as a futuristic and visionary testbed for new communication technologies. It is MDOT's intent to move forward with an operational driver information service based on the results of the DIRECT Operational Field Test.

The Evaluation of the Field Test is being conducted by the University of Michigan, Ann Arbor.

The private industry partners for the project which are participating by contribution of equipment, cash and/or technical services include:

- ❑ General Motors Whelen Engineering
- ❑ Ford Corporation AAA of Michigan
- ❑ Chrysler Corporation Pat-Tel
- ❑ GE/Ericsson Ameritech

Of course, the largest funding partner is the Federal Highway Administration. The project is scheduled to be completed in 18 months.

B. FAST-TRAC

This Road Commission for Oakland County project, located in Oakland County, is just completing its first phase. We are participating in, and coordinating with, the FAST-TRAC project in all stages of development. Twenty-eight intersections are equipped with the SCATS traffic signal controllers and Autoscope vehicle detectors. Ah-Scout beacons have been installed at several intersections and at two locations along I-75 in Troy. Plans are underway to establish a computer-to-computer link between the Traffic Operating Center in Troy and the Metropolitan Transportation Center in Detroit. Plans are presently underway to expand the SCATS and Ah-Scout systems to Rochester Hills, Auburn Hills and Pontiac.

The World Cup Soccer games are coming to the Pontiac Silverdome in June of 1994. MDOT is participating with the road commission in planning traffic surveillance in the vicinity of the stadium and at the two major interchanges at Metro Airport.

2. **Graphic Display System for Real Time Traffic Information Project**

This project applies IVHS technology to communicate real time traffic information by a Graphic Display of the Freeway System Operation. The congestion levels are color coded; green for normal traffic flow and red for heavy congestion, etc. The communication of "information" is by telephone lines. The project consists of setting up the Graphic Display System at the dispatch centers of five public transit agencies and evaluating the results of savings in time by conducting "before" and "after" studies. The agencies participating in the experiment are: Greyhound, United Parcel Service (UPS), Detroit Department of Transportation, SMART (Suburban Mobility Authority for Rapid Transit), and Commuter Shuttle Company at Metro Airport Detroit.

3. ATMS (Advanced Traffic Management System)

The current system of Traffic Surveillance in Metropolitan Detroit consists of 32 miles of freeways including segments of I-94, M-10, and I-75. It is proposed to expand the ATMS to cover the whole 250 miles of the freeway system in stages. The Plan includes installation of CCTV, Machine Vision Sensors, Changeable Message Signs, Ramp Meters and Highway Advisory Radios.

A preliminary study for early deployment is under completion by Rockwell International to provide recommendations on System Architecture, technologies for ATMS, priority corridors, and program recommendations. An RFP for deployment of the ATMS is being finalized for issuance within the next 2-4 weeks.

4. Statewide ATMS Early Deployment

An application is being submitted to the FHWA for funding the early deployment plan preparations for Grand Rapids, Michigan. Funding limitations precluded award of the project this year. We are assured it is at the top of the list for next fiscal year.

The emphasis in this project will be on providing significant user services to the Grand Rapids Metropolitan Area.

5. Metropolitan Transportation Center, Detroit

Located at Howard and Sixth Streets in Detroit, the Metropolitan Transportation Center is the hub of IVHS technology applications in Michigan. The Control Room is the most modern world class facility with twenty-four CCTV monitors. The Center has 16,000 square feet of space with Administrative Offices, Conference Rooms and Concurrent and PC hardware.

A. Freeway Operations and Management

Thirty-two miles of the Detroit Freeways are currently instrumented for traffic surveillance. The field equipment includes 10 CCTV cameras, 14 changeable message signs, 49 ramp meters, 1240 inductive loops and coaxial cable communication system. The field staff at MTC is responsible to constantly maintain the system.

B. Changeable Message Signs

All fourteen signs are installed and in the process of acceptance testing.

6. System Integration Between the MTC in Detroit and the TOC in Troy

As the ATMS projects in Metropolitan Detroit are implemented and expanded, it is extremely important to develop coordination and integration for the ultimate benefit of the prime customer: the travelling public.

Under Congestion Management Air Quality (CMAQ) funding, it is proposed to establish an electronic linkage between MTC and the Oakland County Traffic Operating Center (TOC) in Troy to enable exchange of data and video in real time.

Additionally, several wireless cameras are proposed to be installed at Metro Airport and the Silverdome Area for verification and congestion for quick response.

7. International Border Crossing Project

This is a joint project between the United States and Canada to provide a transparent, seamless border for expeditious crossing of people and goods using IVHS technologies.

The project participants include MDOT, the Ministry of Transportation in Ontario, the Ambassador Bridge and Detroit-Windsor Tunnel in Detroit, the Blue Water Bridge in Port Huron-Sarnia, Immigration and Naturalization Service, and Customs officials from both countries. The final draft of the report has been received by the steering committee and is under review. The next phase of design and cost sharing agreements is being planned. The implementation is expected in 1994-95.

8. Advantage I-75

This project is to deploy IVHS technology to expedite clearance and movement of commercial vehicles across state lines and the international border between Ontario, Michigan, Ohio, Kentucky, Tennessee, Georgia, and Florida. The system integrator consultant is SAIC and Hughes Aircraft Company is the vendor for AVI/DI (Automatic Vehicle Identification/Driver Information). Transponders have been designed and have been allocated on a first cut to ten major carriers. Mainline Weigh-In-Motion (WIM) are approved in several states including Michigan.

9. North Carolina Consortium on Commercial Vehicle Institutional Issues

Ten states, including Michigan, are evaluating the institutional impediments to efficient and cost-effective flow of commercial traffic at the interstate level. A state working group including MDOT, State Police, Treasury, Secretary of State, Public Service Commission, and American Trucking Association is established to review the progress. Institutional issues are being identified in the alternate solutions. Recommendations include implementation of One-Stop Shopping and Road Enforcement. Currently, an application for funding to FHWA under the September 8 FHWA solicitation is being submitted.

10. ENTERPRISE

This is an international consortium of states, provinces, and now, possibly, private industry, involved in IVHS activities. The emphasis on Rural ATIS will benefit Michigan for traveler information on rural segments.

11. Statewide Incident Management Effort

Significant progress has been made toward planning for incident management in southeast Michigan. The Metropolitan Detroit Incident Management Coordinating Committee, with representation from MDOT, FHWA, Wayne, Oakland and Macomb County Road Commissions, City of Detroit, AAA State Police, et cetera meet at the MTC every month on Quick Removal and other Incident Management issues. Several task forces were formed to develop an Incident Management Plan for Detroit, which will be used as a "Blueprint for Action. ■

12. Automated Highway System

Michigan is very interested in this program, and efforts are being made to obtain funding and private support.

13. SMART Cruise Control Platform

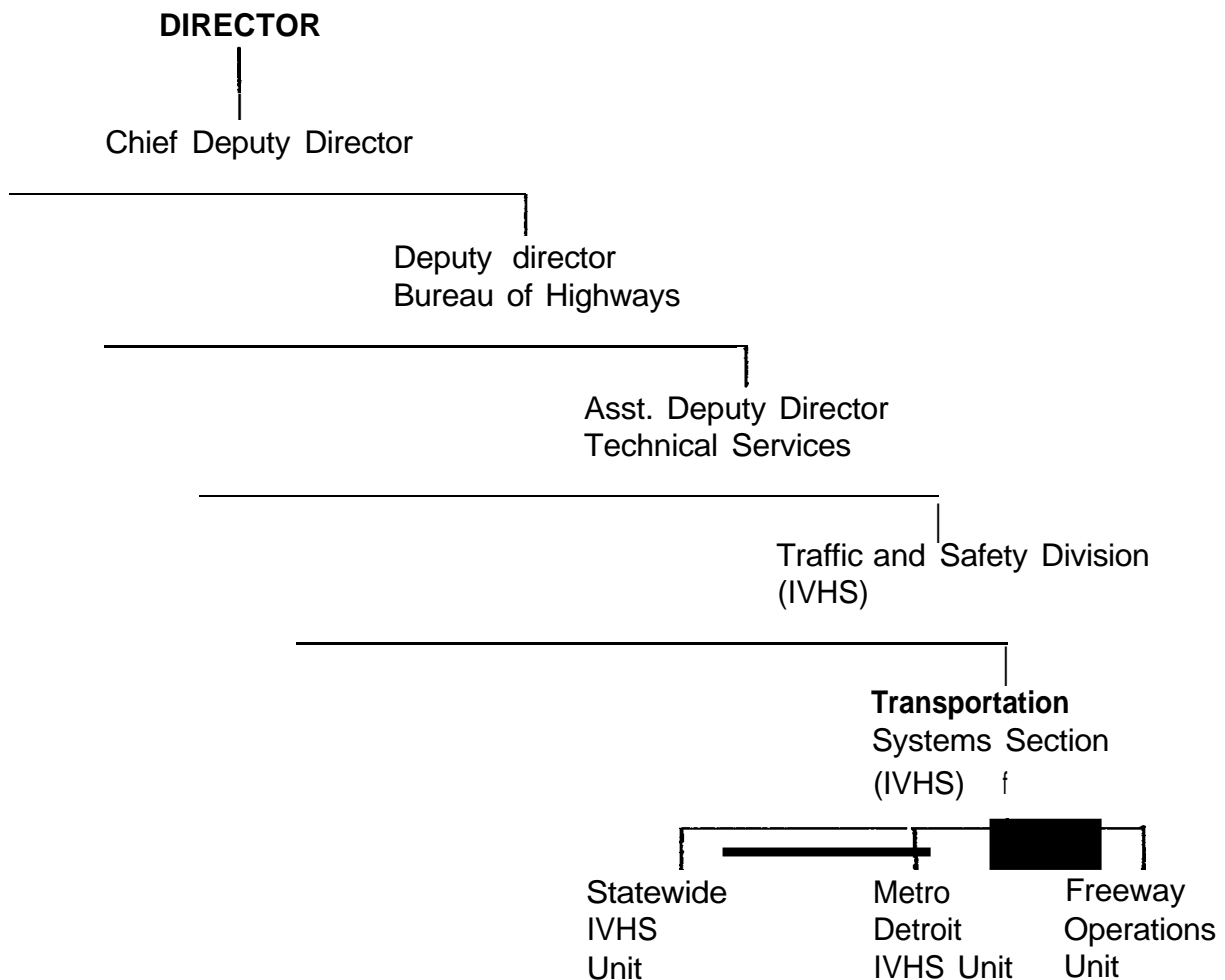
In collaboration with the University of Michigan, a research/test project is in progress for this important component of the IVHS portfolio. This program is likely to have far-reaching consequences affecting design of facilities in the future.

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Michigan Department of Transportation — Organizational Chart



Minnesota Department of Transportation

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Minnesota Guidestar is built on public, private and academic partnerships. Its charge is to introduce advanced transportation technologies and strategies throughout all of Minnesota. Program projects are designed to meet the needs of travelers across the state.

Minnesota Guidestar accomplishments include:

- 24 partnerships with agencies representing federal, state, regional, county and city government. Many of these agencies participate in Minnesota Guidestar's committee structure. They provide local and regional leadership, help make or support Minnesota Guidestar strategic policy decisions, and assist in day-to-day program management.
- Involving the University of Minnesota's Center for Transportation Studies Intelligent Vehicle Highway Systems (IVHS) Institute in 19 separate research and development projects. The Institute is also active in a number of Minnesota Guidestar operational tests and studies.
- Developing and/or signing formal partnership agreements with 13 private companies. These partnerships involve everything from donating and /or sharing consultant services and equipment to leasing and/or purchase of them at greatly reduced costs.
- A workplan that includes 19 research and development projects, 4 scoping studies, 12 operational tests, deployment activities and an emerging initiatives fund.

Other Minnesota Guidestar achievements include:

- Participating in the National IVHS Systems Architecture Study.
- Developing a program communications plan.
- Completing four user-needs studies.
- Hosting the Federal Highway Administration (FHWA) Region 5 IVHS Information Exchange Forum.
- Participating in National IVHS program planning efforts through IVHS AMERICA committee memberships and other technology transfer activities.
- Participating in ENTERPRISE, a multi-state consortium for collaborative research, development and deployment.
- Developing and testing advanced sensor technologies including AUTOSCOPE, CRUISE and a number of other wireless detection systems.

Minnesota Guidestar is a dynamic and growing organization. Teammembers share in the risks and the benefits of successful projects. Minnesota Guidestar teammates are currently working to:

- Revise the program's strategic plan, with new areas of emphasis in research, studies, operational tests and deployment initiatives.
- Launch new initiatives in FM sideband traffic broadcasts, tollroads and congestion pricing, environmental sensors, rural public transportation and commercial vehicle operations.
- Fine-tune the program's organizational structure and develop a private sector advisory panel.
- Continue efforts to remove statutory barriers to public-private partnership agreements.
- Participate in the Automated Highway System Consortium.
- Field test cost-effective nonintrusive alternatives to conventional roadway-based sensor technologies.
- Create a new state-of-the-art laboratory where the public, private and academic sectors can work together on IVHS research, evaluation, education and training.
- Form a regional IVHS AMERICA chapter.

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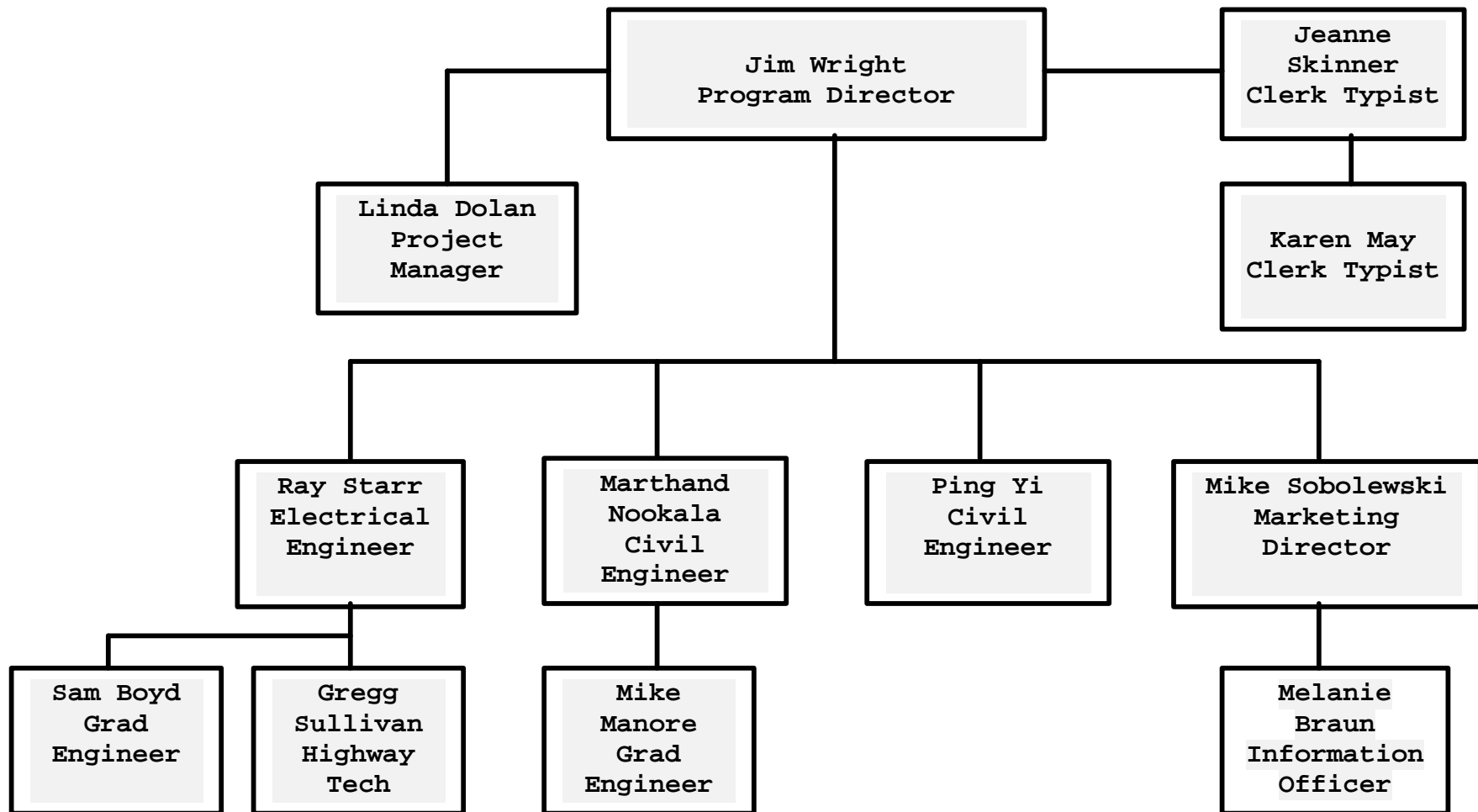
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Overview of the NJHA IVHS Program

The Garden State Parkway is a mature toll road with limited opportunities for physical expansion and capacity enhancement. One consequence of the Parkway's maturity is a flattening out of its toll revenue stream. We must therefore focus our efforts on alternate revenue sources and on making more efficient use of the facilities that we already have. Our vision is to facilitate all forms of travel, including recreational and commuter-oriented, and to promote intermodalism. To realize this vision, the Highway Authority will utilize existing and new technologies to enable motorists to make appropriate travel decisions based on timely information.

We anticipate that IVHS technology and information processing will be integrated with the existing infrastructure to provide an expanding set of consumer services on the Parkway. Through our active memberships in the Committee for a Smart New Jersey, the I-95 Corridor Coalition and IVHS America, the Authority is working to ensure that our systems are compatible with other transportation facilities in our region and along the I-95 corridor, making our transportation network a seamless one.

The implementation of the Highway Authority's vision begins with installation of a fiber optic backbone which will be the heart of all future IVHS communications. The first segment of this backbone will be installed between Raritan Toll Plaza and the New York State line, before the end of 1995. The next segments will be from Raritan to the Toms River Toll Plaza, and then from Toms River to the southern terminus of the Parkway. Once the fiber optic backbone is in place, existing toll data, VMS, ATMS and ice detection systems will be connected to it. As new systems are deployed on the road, they too will be connected to the backbone. These new systems will include highway advisory radio, a roadside beacon based system to give preferential routing information to bus drivers and a network of kiosks that will support a variety of travel applications.

The Authority is one of seven members of the E-Z Pass Interagency Group (IAG). This group is selecting the ETC technology that will be deployed by the toll agencies of New York, Pennsylvania and New Jersey. While the selection process is going on, the Authority is taking steps to upgrade its toll lane and plaza systems to allow the integration of electronic, manual and automatic (coin machines) modes of toll collection.

The current 5-year capital program has allowed us to begin our IVHS program, but many projects cannot be funded until a new capital plan is in place. Electronic toll collection, ATMS and the deployment of fiber optics south of the Raritan Toll Plaza are examples of critical projects that are presently unfunded.

North Carolina Department of Transportation

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Summary of IVHS Program

The North Carolina DOT's primary emphasis at this time is to build the infrastructure to support future deployment of IVHS technologies in urban and rural areas throughout the state.

Three Area-Wide IVHS Plans have been completed or are underway, in the Charlotte, Piedmont Triad region (Winston-Salem / Greensboro / High Point), and Research Triangle region (Raleigh / Durham / Chapel Hill). These have been undertaken as in-house activities by the State Highway Administrator's office and the Statewide Planning Branch.

A Functional Design for a 15-mile Freeway Management System has been completed by the engineering firm of KHC Systems, Inc., under project management supervision of the Congestion Management Unit in the Traffic Engineering Branch.

An Operational Test of an Automatic Vehicle Identification/ Locator system is being carried out as a "Mobility Manager" project with the NCDOT, North Carolina State University, and the Winston-Salem Transit Authority.

A Feasibility Study for ramp metering has been undertaken by JHK and Associates in the Greensboro Urban Area. This project has been managed by the IVHS Engineering Unit in the Traffic Engineering Branch.

1993-94 Public Transportation and Rail Program

The U.S. DOT developed the Intelligent Vehicle Highway Systems (IVHS) program as a tool to enhance transportation mobility, energy efficiency, environmental protection, and safety. Within U.S. DOT, the Federal-Transit Administration (FTA) created the Advanced Public Transportation Systems (APTS) program as part of IVHS to apply advanced navigation and communication technologies to all aspects of public transportation system operations. The City of Winston-Salem has received an APTS grant for the Winston-Salem Transit Authority (WSTA) to develop, implement and test an advanced mobility management system.

Winston-Salem's transportation department manages all human service, ridesharing, faxed-route, traffic control, and community transportation planning. By supporting the existing centralized transportation organization with advanced transit and traffic management technology, new approaches to community mobility can be tested and achieved. Knowledge gained for the city's APTS project will benefit mid-sized transit systems in North Carolina and across the nation.

Winston-Salem's advanced mobility management system will demonstrate the applicability of APTS technologies in the WSTA human service operation. These technologies will include computer trip scheduling and dispatching,

digital communication between vehicles and the dispatch computer, on-board communication devices, and in-agency terminals. Global Positioning System (GPS) location devices and smart card technology will be tested on a more limited basis.

The Winston-Salem APTS grant represents a cooperative effort involving the Winston-Salem Transit Authority (WSTA), North Carolina State University (NCSU), Institute for Transportation Research and Education (ITRE) and North Carolina Department of Transportation. WSTA staff will be responsible for collecting system data, reviewing proposal specifications, monitoring installation of hardware and software, transferring data onto the new computer system and updating data. WSTA will contract with NCSU and ITRE to provide technical consultation, coordinate and conduct research activities, and provide overall project management.

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The Department is involved in a manner of IVHS efforts related to testing and implementation of advanced technologies. Foremost are advanced traffic management and traveller information projects in major metropolitan areas aimed at using new technology to enhance the efficiency of our existing expressways. The following summarizes the major IVHS projects that the Department is involved with:

- Philadelphia Traffic and Incident Management System (TIMS) — A study has been completed on the 115 mile Interstate system in the Philadelphia region. The study proposed a long-term \$100 million phased plan to install IVHS technology on the entire system. Initial implementation has been completed with a \$4.7 million project for installation of surveillance cameras and variable message signs along I-95 and construction of an initial traffic control center at the District office. This system began operations in the Fall of 1993. Additional projects to add I-476 to the system and to test redundant satellite technology are expected to be let during 1994. Other portions of the system will be implemented in a phased approach.
- Pittsburgh Freeway Surveillance and Control System — The project is aimed at reducing congestion on the Penn Lincoln Parkway, especially at the major focal points, the Squirrel Hill and Fort Pitt Tunnels. Preliminary design of the system has been completed for surveillance, incident management and traffic management for the Parkway East and West. Implementation is expected to occur in 1995. Additional portions of the expressway system in Pittsburgh will be considered for future implementation.
- I-95 — Intermodal Mobility Project — The project is intended to reconstruct I-95 while making this a Model 21st Century Urban Transportation Corridor. Preliminary design and environmental studies are underway. IVHS technology will be incorporated into the project design, as appropriate.
- Eastern States CVO Institutional Issues Study — Pennsylvania is the lead state for an eight state study, which includes the states of Delaware, Maryland, Virginia, West Virginia, New York, New Jersey and the District of Columbia. A consultant contract is underway to investigate barriers to the implementation of CVO technologies. Initial interviews have been completed in each state with all agencies that deal with the trucking industry. Multi-state Task Forces have been formed to develop specific recommendations in three areas:
 - . One-stop shopping and data management
 - . Data interchange between agencies, carriers and states; and,
 - . Enforcement strategies and processes.The study is scheduled for completion in the Fall of 1994.

- I-95 Corridor Coalition — The Department is a member of the coalition composed of over 20 agencies along the I-95 corridor from Virginia to Maine. The agencies are addressing coordinated implementation of IVHS. Ten first year cooperative projects are underway.
- Early Deployment Studies & Operational Tests — Pennsylvania continues to look for opportunities in these federal progress. FHWA has granted approval for two early deployment studies that will be underway this year. One is for the Pennsylvania Turnpike to study appropriate use of technology on their mainline. The second is to examine the institutional relationships in the I-95 Corridor in the Philadelphia region and to develop recommendations for better integration as we implement IVHS.

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Texas Department of Transportation

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Introduction

The Texas Department of Transportation (TxDOT), formerly designated the State Department of Highways and Public Transportation, has a mission: "To provide a safe, economical, efficient, and environmentally sensitive highway transportation network for residents, commerce, communities and visitors to the state." (Strategic Plan, October 25, 1990)

In the past, TxDOT responded to increased travel demand by constructing new highway facilities or widening existing facilities. Due to social and environmental concerns, limited right-of-way, soaring land costs, and funding constraints, these methods are not always possible.

Social changes and economic growth, meanwhile, have increased travel in Texas. Growth in the number of jobs, vehicle ownership, women in the workforce and an increasingly suburban lifestyle have resulted in traffic congestion on our urban roadways. Traffic congestion reduces travel speeds, increases stop-and-go driving and unpredictably increases travel times. The result is an increase in:

- . operating costs
- . energy consumption
- driver delay
- air pollution
- driver frustration
- delivery cost of goods and services
- accidents - with its many and varied costs

In response to the traffic growth in Texas, TxDOT is placing a greater emphasis on traffic operations. All elements of traffic operations, including traffic management, will be used to improve mobility and safety by encouraging the most effective and efficient use of the transportation network.

Traffic management is an important part of overall traffic operations. Traffic management helps to fulfill our mission to improve mobility and safety in transportation and, at the same time, address other critical issues of reducing overall user operating costs in an environmentally sensitive way.

TxDOT will promote the use of public transportation and fully capitalize on highway and rail transportation opportunities to help reduce the effects of traffic growth. Traffic management involves the full utilization of all roadways in an entire area and the distribution of traffic over all available facilities. An area-wide viewpoint is therefore needed to realize the full benefits of traffic management. Coordination of the operation of the freeways and primary arterials allows each to best handle the traffic.

There are three principal traffic management strategies:

- Recurrent Congestion Management
- Demand Management
- Incident Management

Recurrent congestion management improves conditions during the peak traffic hours. Demand management encourages motorists to alter their route, travel time or mode to improve the system's performance. Incident management mitigates the effects of traffic accidents, stalled vehicles, special events and other unusual situations.

The implementation of these traffic management strategies will result in a variety of benefits, including:

- Increased travel speeds
- Reduced delay
- Decrease in both primary and secondary accidents
- Reduction in energy consumption and pollutant emissions
- Reduction in driver operating costs
- Reduction in driver frustration
- Increase in motorist information
- Increase in cooperation and coordination with various agencies
- Extended service life of existing facilities, delaying roadway reconstruction costs
- Retrieval and storage of traffic data

These benefits are seen in both recurrent and nonrecurrent congestion. Congestion will still occur, but providing the motorist with information concerning the freeway or arterial congestion will reduce motorist frustration and provide the motorist an opportunity to alter his or her route and reduce delay.

Effective traffic management will require people with both vision and technical skills in the private and public sectors. It will require expertise in traffic engineering, human factors, computers, communications, electronics, economics and, above all else, the ability to blend these disciplines into a coordinated system. It will be a unique challenge to integrate all the disciplines and jurisdictions into a productive team for the benefit of all highway users.

The traffic management systems proposed in the six urban districts (Austin, Dallas, El Paso, Fort Worth, Houston and San Antonio) will help reduce the effects of traffic growth. These systems are now essential with the reduced construction of additional highway facilities. The development and implementation of these intelligent highways provides the foundation for the Intelligent Vehicle Highway System (IVHS). Advanced traffic management systems are the intelligent highway portion of the Intelligent Vehicle Highway System program. With the deployment of the IVHS program for private automobiles, commercial vehicles and mass transit, the benefits of traffic management systems will be enhanced.

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Mission

Virginia PROGRESS's mission is to develop and deploy Intelligent Vehicle-Highway Systems to assist in meeting the Virginia Department of Transportation's primary objective: "To provide safe, efficient, effective, and environmentally sound highway and surface transportation systems now and into the Twenty-first Century."

Focus

The focus of Virginia PROGRESS is to implement well integrated, comprehensive IVHS systems that will improve Virginia's multi-modal transportation system. Virginia PROGRESS will focus primarily on IVHS applications that increase transportation safety. Furthermore, the program will seek to utilize IVHS to improve the operational efficiency of the entire multi-modal transportation system.

Virginia PROGRESS is designed to expedite the deployment of IVHS through a commitment to IVHS research and development. Furthermore, Virginia PROGRESS will concentrate on IVHS operations and maintenance, which are components that play as significant a role as advanced technology hardware.

Specific areas of focus for Virginia PROGRESS are:

- The development of Advanced Traveler Information Systems (ATIS), which will ultimately result in the deployment of a statewide traveler information network.
- The continued development of Advanced Traffic Management Systems (ATMS).
- The research and development of automated highway systems (AHS), particularly through the "Smart Road" project in Southwest Virginia.
- The application of IVHS to improve Commercial Vehicle Operations (CVO).
- The application of IVHS to encourage the efficient utilization of Virginia's multi-modal transportation system.

Course of Action

In order to rapidly deploy well-integrated IVHS in Virginia, Virginia PROGRESS will follow an ambitious course of action. The 20-year program will be structured in three phases, as defined in the national Strategic *Plan for IVHS in the United States*:

- Near Term (1992-1996)
- Middle Term (1997-2001)
- Long Term (2002-2011)

In the near-term phase, Virginia PROGRESS will emphasize IVHS development through upgrading current systems and implementing individual systems as operational tests. The program will concentrate on wide-scale deployment of independent, “stand-alone” systems during the middle-term phase. Finally, in the long-term phase, the focus will be on interfacing systems to achieve well integrated “seamless” IVHS in the Commonwealth.

The fundamental objective of Virginia PROGRESS is to deploy IVHS throughout the Commonwealth in order to help meet Virginia’s growing multi-modal transportation needs. Four areas of concentration have been identified in Virginia PROGRESS as critical to meeting this objective:

- Advanced Traveler Information Systems
- Advanced Traffic Management Systems
- Automated Highway Systems
- Commercial Vehicle Operations
-

These areas are in no way mutually exclusive. Furthermore, their order does not signify any prioritization. In fact, it is clear that the success of Virginia PROGRESS is directly dependent on success in each individual area and the ultimate integration of all IVHS components.

This course of action does not detail complete project specifications for Virginia PROGRESS. Rather, it presents a general description of VDOT’s objectives in each area and goals for each of the program’s phases. As such, the course of action provides the IVHS Steering Committee, which is VDOT’s IVHS policy body, with a general direction. Furthermore, Virginia PROGRESS will remain flexible and responsive in order to meet the dynamic multi-modal transportation needs of the Commonwealth.

IVHS Contacts

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Washington Department of Transportation

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A Brief Summary of the Washington State IVHS Strategic Plan

VENTURE WASHINGTON

The VENTURE Strategic plan is intended to provide direction to the Washington State Department of Transportation's statewide IVHS effort and to serve as a model for other agencies that would like to utilize advanced technology to solve transportation problems. The key elements of the plan are highlighted below.

The IVHS programs and projects recommended in the IVHS Strategic plan are intended to accommodate the following user service categories:

- **Public Transit and Transportation Demand Management:** Includes improved monitoring of transit operations, automatic fare payments, dynamic ride sharing options, HOV priority treatment enhancements, support for employer-based TDM initiatives, and automated transit vehicle control and guidance.
- **Traveler Information:** Provides the transportation user with improved information for making pre-trip or en-route decisions regarding modes, routes, and time. Also provides various traveler information databases, in-vehicle sensors, and monitoring of vehicle performance.
- **Traffic Management:** Traffic Management Centers accept information from various sources for control of traffic flows on freeways and arterials and to provide information to travelers. Includes incident detection and management, traffic network monitoring and control, communications systems, traffic control, and construct on management actions.
- **Freight and Fleet Management:** Allows better planning and monitoring of goods movement and improves regulatory practices. Includes truck route planning and scheduling, vehicle and cargo monitoring, regulatory support and improved inter modal port transfers.
- **Additional Services:** Includes improved management of emergency services, enhanced enforcement monitoring and improved traveler safety and security activities.

Overview

VENTURE Washington is a statewide strategic plan initiated to implement advanced Intelligent Vehicle/Highway System (IVHS) technologies. IVHS is intended to improve highway safety, operating efficiency, environmental quality, and personal mobility through enhanced interactions between the roadway, vehicles, and travelers. This summary highlights the results of the study commissioned by the Washington Department of Transportation (WSDOT) to develop

the statewide strategic plan. The study was conducted by JHK & Associates under the auspices and review of an IVHS Resource Group and WSDOT's Urban Systems Office. The IVHS Resource Group included representatives from WSDOT divisions and regional, local, and modal agency officials.

Current IVHS Projects In Washington State

Washington State is a leader in developing and implementing advanced technology for transportation. Below are several examples.

Traffic Management

WSDOT's Freeway and Arterial Management Effort (FAME) is nationally acclaimed for its innovative approach to traffic management and its integration of technologies on freeways and arterials. FAME addresses several key transportation needs, including HOV treatments, incident management, data collection, and motorist information. The combination of FAME and the recently upgraded Traffic Systems Management Center gives WSDOT a solid foundation upon which to develop a comprehensive IVHS program in the Seattle region.

Traveler Information

Using its traffic management strengths as a basis for developing Traveler Information Systems, WSDOT is testing various information options through the use of research and operational tests. Examples include the "Traffic Reporter" system and Bellevue "Smart Traveler" program. The Central Puget Sound region offers significant opportunities for expansion of traveler information services.

Public Transit and Transportation Demand Management

Current emphasis in the Seattle region on multi-modal alternatives has created an environment conducive to the application of IVHS to public transit and Transportation Demand Management (TDM) services. The Automated Vehicle Identification and Automated Vehicle Location (AVI/AVL) programs initiated by Seattle's Municipality of Metropolitan Seattle and Snohomish County's Community Transit are first steps in this arena. Spokane Transit has also shown an interest in AVL applications. AVI/AVL elements need to be expanded to enhance transit service and management, as well as to support employers that are implementing commute trip reduction programs to meet State requirements.

Freight and Fleet Management

WSDOT's ongoing effort to improve freight and fleet management recognizes the importance of goods movements within the State and across borders. The State needs to maintain a leadership role in commercial vehicle activities so that it can realize the savings and safety that result from effective truck enforcement and data monitoring.

Venture Washington IVHS Contacts

Advanced Technology Branch

Peter Briglia, IVHS Program Manager

Washington State Transportation Center

1107 NE 45th St, Suite 535

Seattle, WA 98105

Phone: (206) 543-3331

FAX: (206) 685-0767

Manages the WSDOT IVHS program. This includes IVHS planning, re-search, and operational tests on a statewide basis. Facilitates deployment statewide.

District 1 (Seattle) Traffic Office

Les Jacobson, Traffic Systems Manager

Washington State Department of Transportation

PO Box 330310

Seattle, WA 98133-9710

Phone: (206) 4404487

FAX: (206) 440-4804

Manages the WSDOT Seattle District Traffic Office, including traffic design, traffic analysis, traffic operations, and electronics maintenance. Responsible for IVHS deployment in the Seattle area.

PART FOUR

Local Transit
Agencies

Ann Arbor Transit Authority

2700 South Industrial Highway
Ann Arbor, Michigan 48104
(313) 677-3902
(313) 973-6338 (fax)

IVHS Contacts

Michael Bolton, Executive Director
William Hiller, ITS Project Manager
Carol Hohnke, Purchasing Agent

Chicago Transit Authority

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IVHS contacts

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Edward Gronkowski

General Manager, Purchasing
Chicago Transit Authority
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Chicago, IL 60554
Phone (312) 6647200, ext. 4868
Fax (312) 828-9865

Pace Suburban Bus Service (Chicago)

550 W. Algonquin Road
Arlington Heights, Illinois 60005
(708) 364-7223

IVHS Personnel list

William Reynolds — Department Manager, Operations Analysis. Responsible for service performance evaluation and operating data collection. Recently made responsible for AVL implementation after several years involvement in AVL planning.

John Paquet — Section Manager, New Technologies. Transferred to this newly created position, reports to William Reynolds and eventually responsible for day-to-day management of AVL program.

Burl Hiles — Maintenance Specialist, Maintenance Department. Responsible for oversight of consultant efforts in developing benchmark specifications for AVL system and specialist on other electronic systems to be integrated with AVL.

James Jarzab — Department Manager, Strategic Planning. Responsible for policy planning, including interagency coordination of AVL and related efforts.

Shamus Misek — Section Manager, Vanpool Services. Reports to James Jarzab and responsible for development and administration of 120 vanpools operated as public transit. Will be responsible for administrative contacts with the Illinois Tollway on their I-Pass AVI project.

Randy Heinemann — Contract Manager Supervisor, Paratransit Department. Responsible for administrative contacts with Motorola on ADVANCE project participation.

IVHS Status

Pace has planned a complete fleet upgrade with AVL by 1997. Capabilities include traffic signal priority requests, as well as coordination with existing radio and farebox systems. Teng Associates have been retained to establish general parameters for a series of RFPs expected to be issued late in '94 for Phase I implementation. In addition, Pace is a participant in the ADVANCE project through interagency agreement with the Illinois Department of Transportation and currently has one paratransit vehicle in testing. Pace also is a planned participant in the Illinois Tollway I-Pass AVI toll collection project and is planned to install I-Pass detectors in 10 vans by the summer of '94.

Suburban Mobility Authority for Regional Transportation (SMART)

660 Woodward Avenue — Suite 950
Detroit, Michigan 48226
Phone (313) 223-2127
Fax (313) 223-2390

IVHS CONTACTS

Mac Lister

Manager of Information Systems and IVHS Coordinator
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650 Woodward Avenue, Suite 950
Detroit, Michigan 48226

Patrick Riley

Manager of Procurement
S.M.A.R.T.
660 Woodward Avenue, Suite 950
Detroit, Michigan 48226

Contracting Information:

SMART was awarded an overall FHWA grant of \$4.5 million; other project budget amounts are preliminary and not for release at this time.

Paperwork has not been finalized on the FHWA grant although it could be in place any time in the near future. The first two projects on the list have had RFP's issued. The dispatch software project awaits only final grant processing so that SMART may award a contract. The AVL project has a proposal submittal date of April 22, 1994. SMART does not have a strategic plan in place yet for IVHS.

In terms of the grant coordination, Mac Lister is SMART's IVHS Coordinator. Any procurement issues should be addressed to Patrick Riley as shown on the organization chart.

Post Office Box 61429
Houston, Texas 77208-1429

Smart Commuter IVHS Operational Test Project

- Project concept is to provide real-time traffic information in the home and work place to influence changes in travel mode, travel route and shift in time of travel, initially along two routes:
 - North Freeway: focus will be on providing bus information as an alternative travel mode and encouraging use of HOV facilities
 - Katy Freeway: focus will be on providing car- and vanpooling information as an alternate travel mode, also encouraging use of high-occupancy vehicle facilities.
-
- Project identified in two phases:
 - System development and implementation (Phase I) 12 to 24 months
 - Data collection and demonstration evaluation (Phase II) 36 months
-
- Cooperation among four key agencies emerged from project conceptualization: TxDOT and METRO sought federal match funding from the Federal Highway Administration and the Federal Transit Administration, respectively; the four agencies are active in management as well as funding of the project
-
- \$5,000,000 identified for the first phase of the project: \$17,000,000 projected budget over length of the project; budget shares for implementation of the system (Phase I) are as follows:
 - I METRO \$1,250,000
 - TxDOT \$1,250,000
 - FHWA \$2,000,000
 - I FTA \$ 500,000
 - TOTAL \$5,000,000
- The project management team is developing funding strategies for the Phase II demonstration evaluation
- Phase I Major Tasks
 - Develop project implementation plans for the Bus and Traffic Information Systems (North Freeway) as well as for the Ridership System (Katy Freeway)
 - Develop Request for Technical Proposals for the Commuter Information Delivery System for the North Freeway component of the project
 - Develop marketing/information program and recruit test and control groups

- ❑ Develop Local Test Evaluation Criteria
- ❑ Collect before-data along both corridors
- ❑ Initiate Demonstration

IVHS Contacts

Darryl Puckett

Director of Transportation Programs

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Manager, Advanced Technology Projects

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Gloria R. Stoppenhagen

Project Manager, Traffic Management

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Vince Raymond

Director, Contracts and Procurement

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Metro-Dade Transit Agency

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IVHS Contact

Terry McKinley
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Metro-Dade Transit Agency
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Executive Summary of MDTA's APTS Strategic Plan

Metropolitan Dade County entered into a contract on behalf of the Metro-Dade Transit Agency (MDTA) with the University of South Florida on behalf of the Center for Urban Transportation Research (CUTR) to develop an Advanced Public Transportation System (APTS) Research and Development Program. The resulting document serves as the overall strategic plan for the implementation of APTS at MDTA.

The document is intended to be dynamic and ever-changing in order to provide the proper guidance and direction to MDTA in development of its APTS program. As MDTA, Federal Transit Administration (FTA) and IVHS America policies and priorities change, this document must also be modified to reflect those changes. It outlines a suggested plan of action concentrated over five areas of need, as currently identified by MDTA, which lend themselves to APTS technology application. All APTS applications implemented by MDTA will reflect a multi-disciplinary approach involving MDTA staff teams, composed of customer service, information management, system operations, communications, and planning expertise.

MDTA has identified five areas of need which lend themselves to applications of APTS. These areas will be expanded further within the Strategic Plan. Priority has not yet been established among the five areas of need, however, the document is intended to supplement and complement the first demonstration grant application regarding Passenger Information Displays (PIDs). A completed grant application for an operational test of PIDs is included as a companion to the Plan.

The Strategic Plan contains an overview of APTS from a national and local perspective, a suggested research and development program approach for each area of need, a discussion of available funding options, and a list of key external APTS contacts including a detailed listing of related APTS vendors.

New Jersey Transit

NJ Transit Headquarters
One Penn Plaza East
Newark, NJ 07105-2246

New Jersey Transit (NJ TRANSIT) is a public corporation charged with planning and operating publicly funded mass transportation throughout the State of New Jersey. The agency operates 2568 transit vehicles on 164 transit routes, carrying upwards of 290,000 passengers per day.

IVHS Contact list

John Wilkins

Director, Service Performance — (201) 491-7977
Responsible for IVHS/APTS corporate planning and coordination

Jim Kemp

Senior Planner, IVHS Technologies — (201) 491-7861
Assistant to Director, Service Performance; liaison to IVHS vendors, external agencies

Shirish Gupte

Director, Operations Systems Development (bus) — (201) 491-7966
Responsible for technical development throughout the bus fleet

James Samuelson

Director, System Operations (rail) — (201) 714-2764
Responsible for technical development in rail traffic control

Mark Revis

Director, Communications Systems — (201) 491-7277
Responsible for technical development in communications systems

Ongoing IVHS/APTS Projects:

- Traffic signal priority
- Automatic vehicle location (radio-beacon “signpost” based)
- Automated telephone information center
- Rail station passenger information system
- On-board information display system
- Voice annunciator system
- Vehicle-to-roadway communications demonstration
- Remote sensing (video, audio, environmental)
- APTS strategy study (vision and 5-year plan)

PART FOUR

IVHS

AMERICA

IVHS AMERICA

Mission and Function of IVHS AMERICA

The Intelligent Vehicle Highway Society of America is the institutional embodiment of the IVHS community. IVHS AMERICA's mission is to coordinate and foster a public-private partnership to make the U.S. surface transportation system significantly safer and more effective by accelerating the identification, development and deployment of advanced technologies. It provides national leadership by collaboratively articulating a vision for the IVHS transportation future, determining the means and activities by which that vision should be realized, and taking actions necessary to stimulate, encourage, and assure timely and effective program execution.

Purposes of IVHS AMERICA

The primary purposes of the Society are:

- 1) Advise the U.S. Department of Transportation regarding IVHS programs. IVHS AMERICA has been chartered as a Federal Advisory Committee to the USDOT.
- 2) Develop IVHS plans and programs. IVHS AMERICA develops strategic plans and program recommendations for the development and deployment of IVHS in the United States.
- 3) Foster IVHS research and development. IVHS AMERICA establishes priorities for R&D activities, and identifies opportunities for combining R&D efforts and resources from government, business and academia.
- 4) Help make decisions on IVHS deployment. IVHS AMERICA, with access to the latest IVHS information, constitutes a resource for public and private decision makers.
- 5) Address legal and institutional issues. IVHS AMERICA anticipates legal and institutional issues emerging and helps to address and manage them.
- 6) Minimize state and local jurisdictional conflicts. IVHS AMERICA promotes regional planning and the development of regional organizations to manage inter-jurisdictional transportation problems and development.
- 7) Identify and develop standards. IVHS AMERICA identifies needs for IVHS standard setting and works with appropriate organizations for standards development and adoption.
- 8) Achieve IVHS architecture consensus. IVHS AMERICA assists in developing system architecture, through process recommendations, education and outreach, and consensus building.
- 9) Coordinate international cooperation. IVHS AMERICA promotes coordination of system approaches and information sharing between nations. The Society sponsors and helps to plan and coordinate international IVHS meetings.

- 10) Provide IVHS information. IVHS AMERICA manages the National IVHS Information Clearinghouse, an electronic source of IVHS news and information. The Society publishes the *IVHS AMERICA* newsletter and the quarterly *IVHS REVIEW*.

Organization of IVHS AMERICA

IVHS AMERICA is an organization of organizations. It is organized to reach consensus on IVHS recommendations to the federal DOT as a utilized Federal Advisory Committee; to develop plans and programs; and to promote and coordinate the development and deployment of IVHS in the United States.

The organization was incorporated in August 1990 as a non-profit educational and scientific association.

The organization is a straight-forward and effective three-tier arrangement, directed by a Board of Directors; managed from a technical viewpoint by a Coordinating Council; staffed by an integrated set of technical committees; and supported by a small staff which helps process, format and present the work of the organization's committees.

Board of Directors

IVHS AMERICA is governed by a Board of Directors, most of whose members are elected by the Society's membership.

To assure a balance of viewpoints, half of the elected Board of Directors represent private sector corporations and associations. The remaining elected seats are filled by representatives of public organizations such as governmental agencies, universities, and associations. The U.S. Department of Transportation designates two Board members. Regular meetings of the Board of Directors and the Coordinating Council are open to the public and serve as meetings of IVHS AMERICA as a utilized Federal Advisory Committee.

Coordinating Council

The Coordinating Council establishes, organizes, and oversees activities of technical committees; and reviews and approves reports, recommendations, and other products of the technical committees for submission to the Board of Directors. The Council coordinates technical committee activities with the programs and activities of other agencies, organizations, and interest groups.

Technical committee chairs and at-large members appointed by the Board of Directors, and up to five members appointed by the U.S. Department of Transportation comprise the Coordinating Council. In addition, the IVHS AMERICA President, Executive Director and the Board Chair serve as ex-officio non-voting members. Officers consist of a Chair, and Vice-Chair, each appointed for a three-year term by the Board Chair, and a Secretary designated by the U.S. Department of Transportation.

Technical committee chairs serve on the Council for the duration of their committee terms. At-large members serve three-year terms and may be reappointed once.

Technical Committees

Technical committees form the backbone of IVHS AMERICA as a deliberative and representative body. They are the Society's action arm on issues that are significant to the IVHS community.

Any representative of a member organization of IVHS AMERICA is eligible for membership on the Society's technical committees. The Coordinating Council, with the concurrence of the Board of Director's Chair, appoints a chair for each technical committee. A Committee Chair may serve a term of up to three years and may be reappointed once. Each Technical Committee Secretary is a federal official appointed by the U.S. Department of Transportation.

-Technical Committees of IVHS AMERICA include the following:

- **Advanced Public Transportation Systems (APTS)**
Promotes and coordinates applications of IVHS technology to public transportation services, with the goal of improving the use and performance of those services.
- **Advanced Rural Transportation Systems (ARTS)**
Represents the rural transportation constituency, encourages and evaluates technology applications aimed at meeting rural transportation needs, and assists in establishing standards in the furtherance of advanced rural transportation systems.
- **Advanced Traffic Management Systems (ATMS)**
Promotes and coordinates research, development, deployment, operation, and evaluation of ATMS technology. Works to ensure that ATMS technology is coordinated with other IVHS technologies.
- **Advanced Traveler Information Systems (ATIS)**
Identifies research, development, and nontechnical issues whose resolution will foster ATIS evaluation and deployment. ATIS technologies include in-office, in-home, or in-vehicle video and verbal response systems that provide real-time traffic condition reports and real-time schedule and route information.
- **Advanced Vehicle Control Systems (AVCS)**
Focuses on IVHS technologies that foster drive assistance and automation of driving. These include collision avoidance and other sensor technologies intended to increase highway capacity while improving safety conditions.
- **Benefits, Evaluation and Costs (BEC)**
Provides oversight and advice on cost-benefit and cost-effectiveness analyses of IVHS projects, and promotes the development of cost-effectiveness methodologies to facilitate standardized evaluations of IVHS products and programs.

- **Commercial Vehicle Operations**

Addresses a range of issues concerning IVHS technologies and commercial vehicle operations, including in-motion weighing of vehicles, electronic vehicle identification, electronic toll collection, vehicle location, and paperless vehicle permitting.

- **Institutional Issues**

Explores existing and potential partnerships and other operating arrangements between and among public, private, and academic sectors. Considers how to encourage cooperation among those with the goal of advancing development and deployment of IVHS.

- **Legal Issues**

Identifies and addresses potential legal impediments to developing and implementing IVHS. These may include patent rights, privacy, antitrust, and liability.

- **Safety and Human Factors**

Studies interaction and compatibility between IVHS technologies and the human beings who apply and are affected by them. Works to identify and address areas where IVHS technology can yield safety benefits.

- **Standards and Protocols**

Identifies areas where standards and protocols are needed to facilitate development and deployment of IVHS technologies, and coordinate IVHS-related activities between the standards-setting organizations.

- **System Architecture**

Serves as focal point for reviewing, coordinating, and discussing system architecture activities of government agencies and private-sector organizations. Recommends processes to guide the development and evolution of a system architecture that functionally links the various IVHS technologies.

- **Environmental and Energy**

Coordinates and focuses the environmental impact thinking already being done in the technical application and other cross-cutting committees.

How to Get Involved

There is only one qualification for joining IVHS AMERICA: an interest in Intelligent Vehicle-Highway Systems. You should decide if your organization's objectives will be advanced by the purposes and programs of IVHS AMERICA. If your answer is yes, you should contact IVHS AMERICA at:

400 Virginia Avenue, S.W., Suite 800
Washington, D.C. 20024-2730
(202)484-4847
(202)484-3483 (Fax)

Membership in IVHS AMERICA is open to public and private organizations from any country in the world. Members include corporations and companies, public and private associations, universities, and government agencies.

IVHS AMERICA Organization

Board of Directors

Chairman: Fred Tucker

President: Les Lamm

Executive Director:
James Costantino

Kip Stacy
Executive Ass't

Carla Melonson
Administrative Ass't

Plans & Programs

Doug Robertson
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Josie Plachta
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Drake Pearson
Marketing Support Specialist

National IVHS Clearinghouse

Burt Stevens
Director

Conferences & Meetings

Bonnie Jessup
Director

Jennifer Bond
Conference Assistant

IVHS AMERICA

Committee Staff Assignments

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Nominating	Jack Kay JHK& Associates Ph 510/464-7700 Fx 510/464-7848		Jim Costantino Ph 202/484-4847 Fx 202/484-3483
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Institutional issues	Sadler Bridges Texas A & M Ph 409/845-5814 Fx 409/845-9356	Tom Marchessault DOT Ph 202/366-5412 Fx 202/366-3393	Craig Roberts Ph 202/484-2895 Fx 202/484-3483
Legal Issues	Cynthia Moreland Motorola Ph 708/576-0312 Fx 708/576-0721	Julie Dingle FHWA Ph 202/366-1394 Fx 202/366-7499	Craig Roberts Ph 202/484-2895 Fx 202/484-3483
Safety & Human Factors	Gene Farber Ford Motor Co. Ph 313/845-5305 Fx 313/594-2105	August Burgett NHTSA Ph 202/366-5672 Fx 202/366-7237	Donna Nelson Ph 202/484-4133 Fx 202/484-3483
Standards & Protocols	Rick Weiland SEI Ph 708/699-6500 Fx 708/699-6553	George Schoene FHWA Ph 202/366-2197 Fx 202/366-8712	
Systems Architecture	Bob Parsons Parsons Trans. Ph 510/938-3069 Fx 510/938-3069	Lee Simmons FHWA Ph 202/366-8048 Fx 202/366-8712	Rick Schuman Ph 202/484-4543 Fx 202/484-3483
Energy & Environment	Phil Shucet Michael Baker Inc. Ph 804/431-0049 Fx 804/431-0812	Charles Goodman FHWA Ph 202/366-8070 Fx 202/366-7696	Chris Body Ph 202/484-4131 Fx 208/484-3483

IVHS AMERICA Technical Committee Chairs April 1994 Appointments

First Terms

ARTS	Dennis Foderberg , <i>Director, IVHS Institute, University of Minnesota</i>
ATMS	Leslie N. Jacobson , <i>Traffic Systems Manager, Washington DOT</i>
ATIS	Joel Markowitz , <i>Manager-Advanced Systems, Oakland MTC</i>
TD&T Task Force	Kenneth C. Orski , <i>President, Urban Mobility Corporation</i>
Intermodal Task Force	John West , <i>Division Chief, CALTRANS</i>

Second Terms

APTS	Michael Bolton , <i>Executive Director, Ann Arbor Transit District</i>
AVCS	Steven E. Shladover , <i>PATH Acting Director, University of California</i>
BEC	Donald E. Ome , <i>Director, Transportation Systems, TRW/ESL</i>
Communications Task Force	Jerry Marsh , <i>Senior Communications Analyst, IIT Research Institute</i>
Energy & Environment	Philip Shucet , <i>Assistant Vice President, Michael Baker, Jr., Inc.</i>
Institutional Issues	G. Sadler Bridges , <i>Executive Associate Director, Texas Transportation Institute</i>
Planning	Thomas Deen , <i>Executive Director, Transportation Research Board</i>
Legal Issues	Cynthia J. Moreland , <i>Senior Division Counsel, Motorola, Inc.</i>
Safety	Eugene I. Farber , <i>IVHS Strategy & Planning, Ford Motor Company</i>
Societal Implications Task Force	Edith B. Page , <i>Manager, Govt. Programs-Transportation, Bechtel Corp.</i>
Standards & Protocols	Richard J. Weiland , <i>Vice Chairman & General Manager, SEI Technology Group</i>
Systems Architecture	Robert E. Parsons , <i>Principal, Parsons Transportation Associates</i>
c v o	C. Michael Walton , <i>Interim appointment</i>

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Communications Task Force	Frank Mammano FHWA Ph 703/2852405 Fx 703/2852264	Jim Chadwick Mitre (Acting) Ph 703/883-7910 Fx 703/883-6809	
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Architecture Consensus	Bob Parsons Parsons Trans. Ph 510/938-3069 Fx 510/938-3069	Mike Schagrin FHWA Ph 202/366-2180 Fx 202/366-8712	Rick Schuman Ph 202/484-4543 Fx 202/484-3483